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HEADLINERS

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Volume 91 **New York, December 1, 1934** **Number 3**

Uses of Rubber for Transportation

H. F. Schippel [1]

THE importance of rubber in transportation is due to its unique combination of physical properties not possessed by any other material. These are its relatively enormous deformation within the elastic range, its abrasion-resistive ability due to the incorporation of compounding ingredients, and its sound-deadening effect due to its vibration-dampening ability. It is due to one or more of these properties that rubber finds its place in each specific application in service. Other admirable properties are its electrical insulation, its moderately low weight, and its plasticity before vulcanization. From a manufacturing standpoint we owe a great deal to this plastic property, which enables us to form the rubber articles and vulcanize them in molds, thereby providing cheap and accurate duplication. It is also this plastic property of rubber that enables us to incorporate therein a great variety of compounding ingredients, by which the physical properties of the resultant compounds are adapted to meet the requirements of service.

Just as in the manufacture of steel, there may be added a variety of materials to produce strength, hardness, or ductility, so in the manufacture of rubber goods we incorporate various ingredients to produce similar properties in the finished articles. In Figure 1 are shown the stress-strain curves for some typical rubber compounds treated in this manner. The curve marked "Tire Carcass" represents very closely the elastic property of a rubber free of any other ingredients than those essential to the vulcanization process. Such a rubber has high elongation and strength. A hard material such as steel has almost no elongation at all by comparison within this stress range. (See line marked "Steel.") The "Tire Tread" curve indicates the strength necessary for abrasion resistance, and the other 2 curves show the general properties of rubbers used in mechanical goods where high ductility or strength is not a prime requisite.

The simple elastic deformations which constitute the great value of rubber are shown in Figure 2. They are tensile, compressive, and shear strains, and a representative article utilizing each of these simple strains in service is also shown. As an example of stretched rubber, we have the inner tube; of compression, the solid tire which, while declining rapidly in use over the highways, is finding a wider application in industrial transportation; and of shear, the vibration insulator, which appears in a wide variety of types to cushion the prime movers and the pay loads in vehicles.

When transportation is considered in a broad aspect, it presents a surprisingly wide range of transporting methods. There is one class comprising vehicles that roll on wheels continuously, such as automobiles, trucks, and buses, railroads and street cars, road building machinery, industrial trucks and trailers, agricultural tractors and trailers. Another class rolls on wheels intermittently, and this includes airplanes and amphibians. Still another class embraces transportation by water, for which a great many articles of rubber are made. Lastly is the method of transportation in which the conveying medium is stationary or semi-stationary, such as pipe lines, hose, electrical conductors, belt conveyers, etc.

Wheel Diameter

During the whole history of pneumatic tire development there has been a gradual reduction in wheel diameter. The old line of high pressure passenger car tires that preceded the balloon types was mounted on wheels ranging from 23 to 27 inches diameter. They were made this way in the old days so that you could drive over stray cattle without hurting them, but with the introduction of the balloon tire and more recently the low pressure balloon, due to their greater cross-sectional height, it was necessary to reduce the wheel diameters to keep the overall diameters down. But as the mileage of good roads throughout the country has increased enor-

[1] Design engineer, The B. F. Goodrich Co., Akron, O. Paper read at the meeting of the Cleveland Section, S.A.E., Sept. 17, 1934.

mously, and it is now rarely necessary for a car to be run on deeply rutted roads, the under-clearance of the car has not been such an important item of design, and this factor, together with the demand for lower car height, has brought about still further reductions in wheel diameter, until we now have 16-inch wheels in common use, and 15-inch wheels in the offing. (See Figure 3.) Now, every time you take an inch off the wheel diameter, you make the tire roll around about 20 times more in a mile, and so use up the tire tread and the carcass life that much faster. But that fact wouldn't mean anything to the average car user, it's too technical. He gages tire performance by his speedometer mileage; so in self-defense the tire manufacturers reduce the load ratings of the smaller diameter tires to compensate, not only in the passenger car line, but in the truck and bus tire line as well.

Rims

Because rims on which tires are mounted cannot be separated from a discussion on tires, I would like to review the present rim situation. (See Figure 4.) We progressed from the clincher rims for passenger tires to the straight-side rims and in the last few years have adopted generally the drop-center type. Now with the new low pressure tires, we are using the drop-center rim, but with slight changes in dimensions. You will note the tendency toward greater widths between flanges. Of course the tires used on the narrower rims were less in cross-section, but regardless of this point, there has been a distinct movement toward wider rims in proportion to the tire sections. You will notice the rim for the low pressure tire has a beveled bead seat. (See Figure 5.) This has been used for some time on airplane rims and permits of a tighter bead fit without difficulty in mounting and demounting the tire. It is desirable to have a snug fit of the tire bead on the rim to prevent raising of the toe of the bead when the tire is deflected; also the radial and lateral runout of the tire is reduced.

Figure 6 shows the various types of truck rims in use, the principal difference being in the method of locking the loose flange. They all have a common 28° bevel for interchangeable mounting on the wheels. Rims have a profound effect on tire life, and this point is particularly true with truck tires. It is absolutely essential that proper rims be used with tires, and both operators and truck manufacturers have realized this fact more in the past few years. Figure 7 shows 2 typical dual wheel mountings, the demountable rim and the demountable wheel types, and in all cases of dual mountings, it is necessary that the proper sized rims and spacings be used for maximum tire service.

Load Capacity and Inflation Pressure

To anyone not familiar with tire design and construction it may seem somewhat of a mystery how tires are rated for load capacity and inflation pressure. To start out from fundamentals, you all appreciate the fact that if all roads were absolutely smooth, there would be no need of any tire cushioning at all. As a more or less perfect example of smooth road surface, we have railway coaches mounted on steel wheels and rolling along hard steel rails. Any discomfort experienced in railway travel is certainly not due to sharp vertical impacts that are so common to automobile travel. To absorb these road impacts with a minimum shock upon the body of the automobile it is necessary to have a flexible periphery on the wheel. A tire is fundamentally a flexible wheel periphery, and if we called them that, maybe we could get more money for them. Now the flexibility of the tire depends upon 2 things, inflation pressure and size. What inflation pressure does to riding quality you all know too well, so there's nothing more I can add except to say technically that lower pressure means greater tire deflection and hence less reaction due to rough spots in the road. The effect of tire size, however, may not be quite so clear. For instance, by merely using oversized tires on your car you cannot expect improved riding quality. In fact for the same inflation pressure the larger tires ride harder. But the larger tires, due to their ability to carry a greater load at the same deflection as the regular tires, permit you to lower the pressure when the load is lower, and in this way greater comfort is realized.

So we may classify the different lines of tires according to deflection at their rated loads. High pressure truck tires are rated at approximately 11% deflection for maximum load, truck and bus balloons at 13%, regular passenger car balloons at 16%, low pressure passenger balloons at 17%, and airplane tires from 21% to 35%. High pressure truck tires, owing to a greater number of plies, are operated at higher inflation pressures and so are capable of carrying more load than heavy duty balloon tires of the same cross-sectional size, even in spite of the lower deflection permissible. For example, take the 8-inch truck tire, which is inflated to 90 pounds' air. By removing 2 plies from the carcass and reducing the inflation to 65 pounds, you have a 9.00 balloon tire. The 8-inch tire carries 3,600 pounds, but the 9.00 tire only 3,250 pounds, a reduction of 10%. But the 9.00 tire deflects $1^{1}/_{16}$-inches; while the 8-inch tire deflects only $^{13}/_{16}$-inch; so the riding quality of the 9.00 tire shows a considerable improvement over that of the 8-inch tire, so much so that truck and bus manufacturers are rapidly realizing the advantage of the heavy duty balloon tire for the higher speed service requirements of today. So that with all these types and sizes of tires, and all the wheel diameters, and different plies, it becomes a distinct branch of engineering just to know all about these things, just like civil engineering, astronomy, and election returns.

The importance of maintaining proper inflation pressure in tires should not be overlooked if maximum service is to be obtained. Likewise tires should not be continually overloaded, and tire manufacturers have estimated as the result of a vast amount of experience that if a tire is run at 20% overload continuously, the mileage expectancy is reduced to 70% of normal (see Figure 8); while at 40% overload the expectancy is reduced to 51%, and so on, at an increasingly rapid rate. At 100% overload the mileage expectancy is only 25% of normal.

There are, of course, vast differences in tires, but at the same time tremendous differences exist in the types of service to which they are subjected. Figure 9 gives a graphic illustration of differences in rate of tread wear at different speeds and temperatures. Figure 10 shows differences in rate of tread wear in 2 different localities. Figure 11 shows the effect of different road surfaces. Figure 12 shows the mileage obtained when using different sized tires on a particular type of bus.

Tire Noise

Another property of utmost importance is noise, or, to be more accurate, silent operation, particularly in connection with the performance of the modern passenger car. There was a time when if you asked a mechanic to listen to a noise in your car, he would ask "which noise?" and tire noise was almost completely masked by the noise of the fan, the motor, the transmission, and the wind. But all the noises produced by the power plant have been so reduced that the tire and the wind

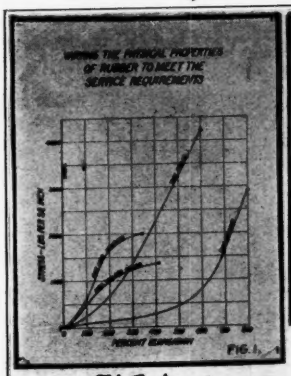
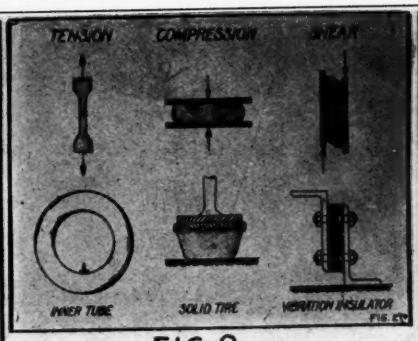


FIG. 1



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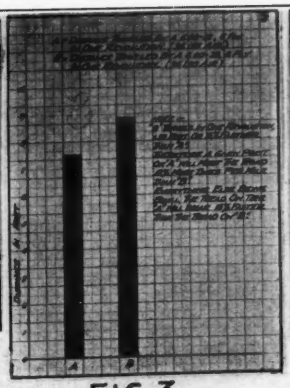

FIG. 3

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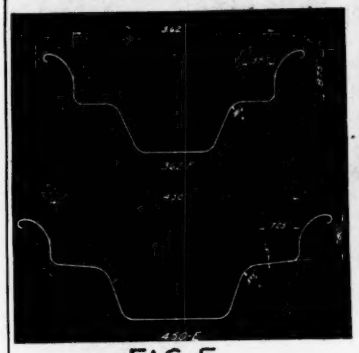

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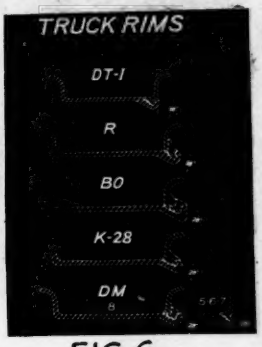

FIG. 6

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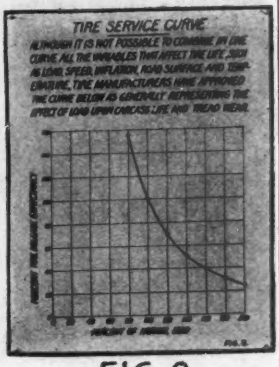

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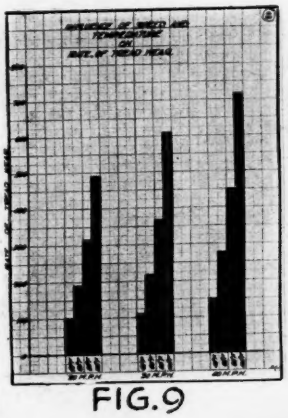

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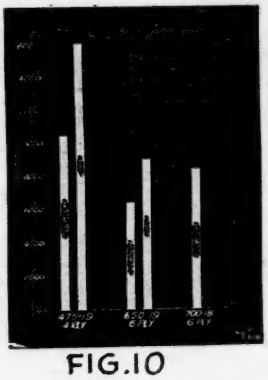

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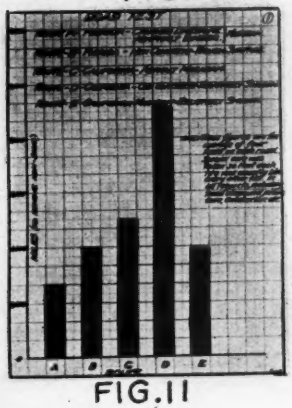

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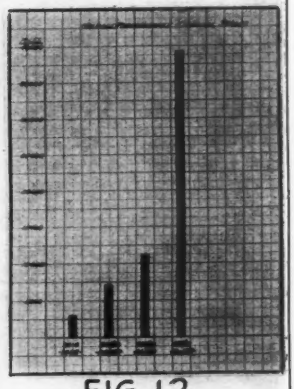

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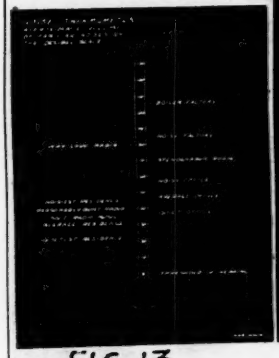

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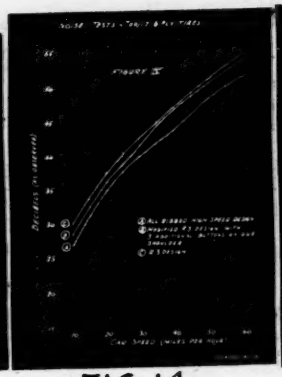

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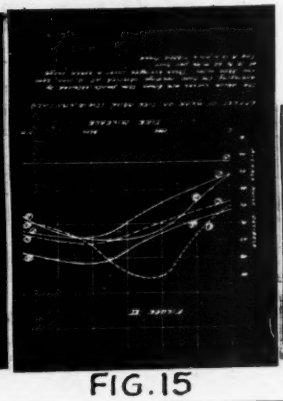

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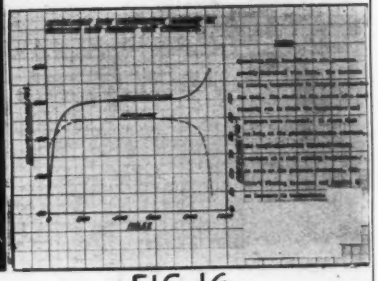


FIG. 16

noises have stood out in contrast, and it was necessary for the car designer to streamline the car just as much to reduce noise as to decrease the air drag, and also to insist upon quieter running tires.

Those of you who attended the annual S.A.E. meeting in Detroit last January had the opportunity of hearing some very interesting discussion on tire noise, its cause, measurement, and cure. You would have gained the impression that tire noise is largely due to the non-skid buttons of rubber in the tread design and that the only positive cure lay in the use of ribbed tread designs, although there are many modifications of present tread designs that reduce both volume and prominence of the noise. But apparently nothing can be done by the tire engineer to eliminate the noise due to brick and gravel roads.

The volume of a noise is measured in a unit called the decibel, and Figure 13 is a diagrammatic representation of a number of familiar noises on the decibel scale. There are a number of factors involved in the proper measurement of tire noise. The noise measurements should be made over a wide speed range, and the variation of noise during the life of the tire tread design should also be observed. Figure 14 shows some of the results obtained during our development work on tire noise. It shows both the effect of a tread design modification and also the relative quietness of an all-ribbed design. Figure 15 shows the variation of noise during the first 3,000 miles of the tire's life. The increases noted during the first one to 2,000 miles are due to irregular wear of the tread design buttons, and curve E shows the comparative results obtained on a typical tread design with buttons in the center. It should be recognized, however, that tires have several different functions to perform: they must have good wearing qualities and good skid resistance in addition to good appearance and quietness. It is possible to combine these qualities, but perhaps at the sacrifice of one or another. Therefore before adopting any definite design to overcome any one fault it is important that we be thorough enough in our development work to make certain that some important feature has not been jeopardized.

Effect of Temperature

No general discussion of tires would be complete without some reference to the important effect of temperature upon tire performance. I do not mean so much the air temperature in the locality, although this contributes its share to the final operating temperature, but the important effects of overload, under-inflation, and speed.

Long-sustained high-speed running may have a very injurious effect upon the tires. In the southwestern states an average scheduled speed of 60 m.p.h. over long runs is not uncommon, and the tire temperatures under these conditions may run extremely high, particularly in the summer months. Tire deterioration is not directly proportional to operating temperature, but increases according to some exponential function of temperature, the exponent probably being somewhere in the neighborhood of 2, and so it is quite obvious that when tires reach temperatures in service, their deterioration must necessarily be extremely rapid. Figure 16 shows the results of a run which ended in disaster for the tire. Figure 17 shows the beneficial effect of an increase in rim diameter. Figure 18 gives a general idea of the effect of load upon tire temperature. Also, the effect of brake heat upon tire life due to the crowding of the brake drum against the rim with inadequate ventilation is a subject upon which much has already been written, and to correct which condition so much effort has already been directed with very beneficial results.

Road Impacts

Considering the application of the pneumatic tire to wheeled vehicles in a broad aspect, it is remarkable how much this one article has contributed toward the safety, economy, speed, and comfort of motor travel, and to the reduction of maintenance of motor vehicles and highways by virtue of its cushioning properties. It is remarkable to note the strides made in reducing the wear and tear on the public highways both by the use of pneumatic tires to replace solids and also by the reduction of inflation pressure through the adoption of balloon tires in this type of service. Figure 19 shows the relative road impact of these different types of tire, for speeds ranging up to 35 m.p.h. It should here be explained that road impacts are of 2 types, shock and drop. Figure 20 clearly illustrates the difference. When the tire first hits an obstacle protruding upward from the surface of the road, the road and vehicle both experience an impact which is called a shock impact to the road and a shock reaction to the vehicle. If this impact is of such magnitude and duration that the axle of the vehicle experiences an upward movement, then after passing over the obstacle the tire drops back into contact with the road, and the ensuing forces are called drop impacts and reaction respectively.

It has been found that drop reactions tend to reach maximum values at speeds between 20 and 40 miles per hour, as illustrated in Figure 21, and above this speed the tire has a tendency to envelop the obstacle and develop subsequent drop reactions which decrease in magnitude. On the other hand the shock reactions tend to increase progressively up to about 40 miles per hour and assume a constant value thereafter.

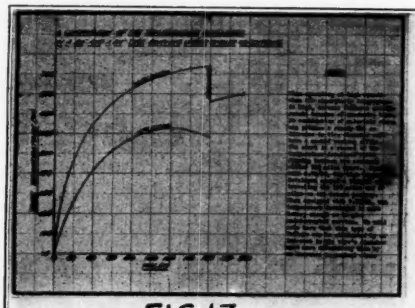
Farm and Road Building Equipment

I have taken up considerable time to present a brief yet comprehensive survey of the pneumatic tire for passenger cars, trucks, and buses, because these vehicles comprise the important fields of its application, but there are many other wheeled vehicles for which the pneumatic tire provides a superior performance. I have in mind such applications as agricultural tractors and trailers, road building machinery, and industrial tractors and trailers for the handling of fragile loads.

The use of rubber tires on farm tractors has passed the experimental stage and during the past year has been definitely proved to a point where the advantage over steel wheels is unquestioned by the tractor engineer and the country's leading agriculturists. A number of individual tests made in various parts of the country in which our tires were tested on different makes of tractors and in various farm operations prove the advantage of the rubber tire over the steel wheel in the following major respects: (1) increased speed; (2) reduced fuel consumption; (3) greater comfort to the operator.

It is rather surprising how this radical departure from the conventional steel wheel has been so quickly taken up by the farmer and by the manufacturer of tractors to a point where it has changed the thinking in tractor design. Lighter and speedier tractors are being built so as to be adapted better to rubber tires and thereby take greater advantage of the change.

The rubber tire on farm tractors has created a great amount of interest in rubber on other farm equipment such as combines, corn shellers, threshers, wagons, etc., which are pulled behind the tractor, and the manufacturer is now planning to use rubber tires on this type of farm equipment so as to take greater advantage of the rubber-tired tractor and make all wheeled equipment more mobile.



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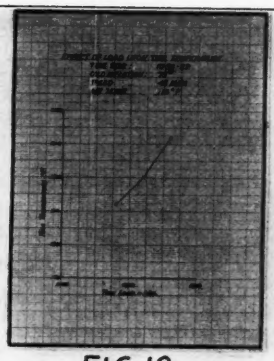

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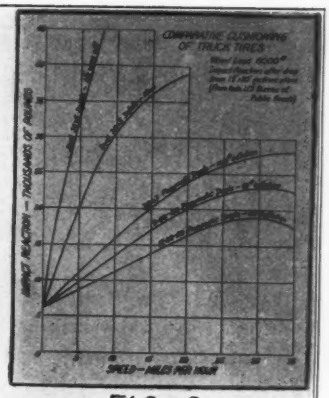

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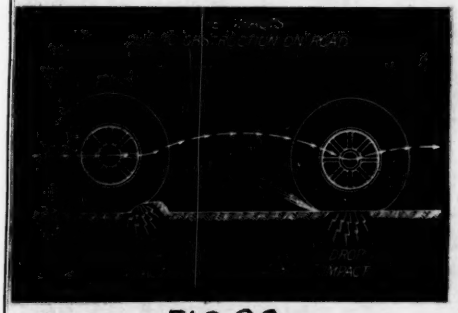

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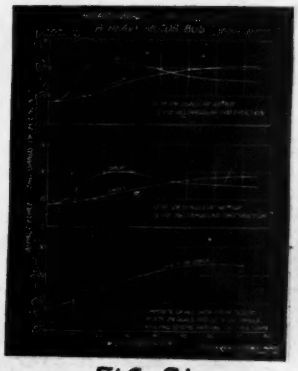

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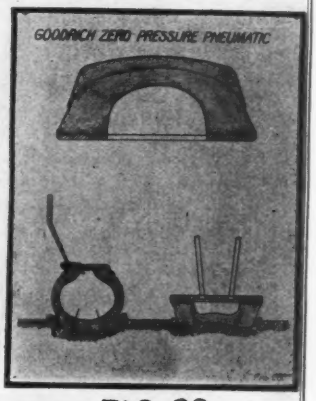

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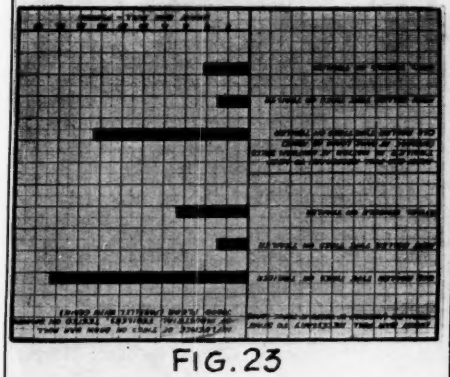

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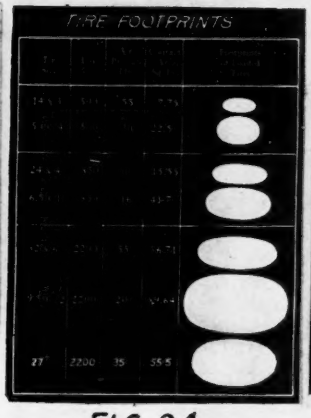


FIG. 24

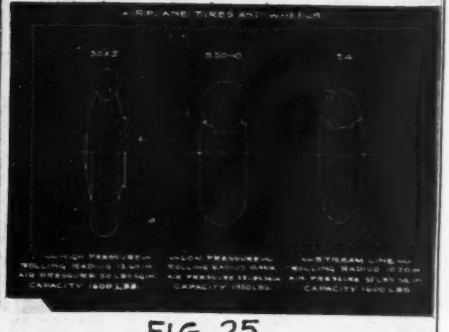


FIG. 25

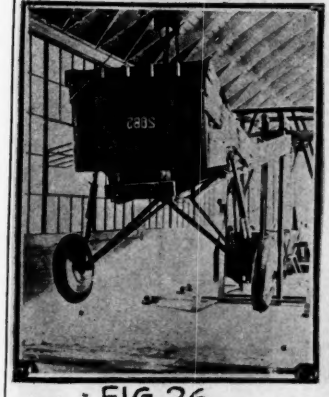


FIG. 26

FIG. 27

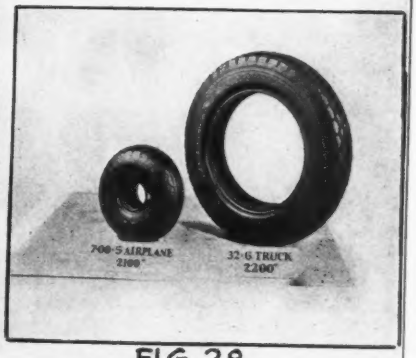


FIG. 28

Although the pneumatic tire has been used to some extent on road-building machinery such as graders and scarifiers, it has a tendency to produce chattering of the blades, particularly on hard surfaces, and this is very objectionable. High tractive effort is very essential for this type of service, and with these requirements in mind a special type of tire is being used with remarkable success. Figure 22 shows a cross-sectional view of the tire, and below this is shown the principle of its operation. Whereas the pneumatic tire pushes outward against the soft material into which it has sunk and sinks itself still deeper, the zero pressure pneumatic packs a track for itself in the soft material and stays on top. In this it is assisted by its larger footprint, which produces the so-called "snow-shoe" effect.

Industrial Tractors and Trailers

Probably few of us have any idea of the tremendous number of industrial tractors and trailers used to handle merchandise around our ports, railway terminals, and manufacturing plants. The tractors are either electric or gas-propelled, and due to the fact that these tractors and trailers are run largely on concrete or wood floors, the industrial solid tire finds a wide application in this service. It saves the floor from destructive impacts and reduces the draw-bar pull required to move the laden vehicles. Figure 23 shows graphically some of the results of this development work. For fragile loads such as are encountered in the ceramic industry the industrial pneumatic tire is increasing in popularity.

Airplane Tires

Now we will switch over from the one of the slowest types of transportation to the fastest, and consider what the airplane owes to rubber for its development. In this division of transportation the pneumatic tire is also the most important item, and it has been used to cushion the shocks of landings and take-offs from the very beginning Only rubber can safely take care of the rolling contact with the ground under these conditions, to resist the wear, bruises, and impacts.

For a long period in the development of the airplane the high pressure tire was the accepted standard. These tires gave very acceptable performance, but were deficient in 2 respects. Their cushioning properties were somewhat limited, and they sank deeply into soft mud surfaces. Outside of these 2 objections, it cannot be said that they lacked in other properties, such as lightness, rolling radius, brake effectiveness, and inasmuch as streamlining of other parts of the airplane had not been carried to any great degree of refinement, and airplane speeds were lower than they are today, the parasitic drag of the tires was not disproportionate. But the 2 objections already mentioned brought about the introduction of a new line of tires which on a load-capacity basis were of larger cross-section and lower inflation pressure. This line of low pressure tires effects a considerable improvement in riding quality on rough airport surfaces and gives a much greater footprint area to sustain the airplane on top of soft ground surfaces. Figure 24 shows a comparison of high and low pressure tires from this aspect and incidentally includes some figures on this characteristic of the streamline tire. The footprint of the low pressure tire is approximately 2½ times that of the high pressure tire of equivalent load capacity. Figure 25 shows the comparative profiles of the 3 types of tire mentioned.

As regards improvement of riding quality due to reduced inflation pressure, it is necessary that we keep this consideration quite distinct from the shock-absorption qualities of the complete landing gear because in the latter case the oleo gear, or shock absorber, plays an important part. On rolling ground or ground where fairly large irregularities are present the tire cannot completely absorb the obstacles and so imparts this motion to the lower end of the landing gear, and only the oleo can be of any substantial assistance in maintaining the plane in level motion. The "dead-beat" quality of the oleo gear is vastly superior to the tire under such conditions, for the tire, being essentially a chamber of compressed air, is extremely resilient by comparison. On the other hand for small surface roughnesses such as are encountered on gravel and dirt runways the low pressure tire is eminently suitable. These tires not only improve the riding comfort under such conditions, but decrease body noises and prolong the life of the airplane structure. Figure 26 shows some of the methods of measuring the various characteristics of airplane tires.

The most important field for airplane tires is in the transport airlines, where consolidated business in passenger mileage for 1933 was 27.3% greater than in 1932, and in mail carried 18.5% greater. Although developments early this year in connection with air mail have had a serious effect upon prospects for 1934, yet up to that time this business showed no relapse, but showed a steady gain during the entire period of the depression, in the face of decreases of from 40% to 60% in all other forms of transportation. It is sincerely to be hoped that this important division of transportation will eventually work out a solution to present difficulties, and I believe it will.

Figure 27 shows the relative size of a truck tire of high carrying capacity; while Figure 28 shows a similar comparison with the tail wheel tire.

Besides the tires and tubes, are gas and oil hose, grommets, window channel, sound-proof ventilating hose, motor mounts, and sponge rubber in many places, all of which installations serve in one way or another to reduce noise and also vibration, which has a direct bearing on maintenance cost. *(To be continued)*

Estate Production Costs[1]

A COMPILATION, covering 79 Malayan sterling companies from 1920 to 1929 inclusive, 85 in 1930 and 1931, 83 in 1932, and 79 in 1933, indicates that the average annual total expenditure per pound of rubber produced, expressed in pence, has been as shown below; the average price realized (for all grades) per pound, and the average London price (for ribbed smoked sheets) also are shown.

PENCE PER POUND OF RUBBER

	Malayan Estates		
Year	Approximate Net Cost of Production	Average Price Realized	Average London Price R.S. Sheets
1920	11.40	17.10	22.44
1921	12.23	12.26	9.56
1922	8.29	11.18	9.13
1923	9.52	13.33	15.31
1924	9.08	14.34	13.88
1925	8.48	25.99	35.06
1926	9.86	23.82	23.75
1927	10.30	18.10	18.44
1928	8.41	11.90	10.69
1929	6.28	9.72	10.25
1930	5.02	5.02	5.91
1931	2.97	2.99	3.13
1932	2.47	2.41	2.44
1933	2.46	2.90	3.25

In comparison with these figures the average London price for the first half of 1934 was 5.65 pence, and for July, 1934, 7.06 pence. In considering what is a "reasonable price," the distant past deserves very little consideration in comparison with recent-year performances.

[1] Special Circular No. 3,546, Leather-Rubber-Shoe Division, Department of Commerce, Washington, D. C.

Retreading

Preparation of the Tire

D. C. McRoberts

FOLLOWING the casing inspection[1] comes a series of operations in which skilful workmanship, quality materials, and cleanliness play their respective and important roles in the business of retreading tires.

Preparing the carcass for retreading consists of removing the old tread and buffing the carcass. These operations are inevitably dirty and dusty ones; consequently they should be conducted in a room fitted for them and apart from all subsequent procedure.

Long and Short Sidewall Skives

Hand Removal of Tread

Removing the tread may be accomplished in any one of several ways. The simplest, from point of view of equipment involved, but not from human effort required or quantity produced, is that of cutting the tread off with a sharp wet butcher knife. With the casing hanging on a bench arm the operator cuts slantingly into the shoulder of the tread until the knife edge reaches the cushion layer immediately above the top carcass ply. Flattening the knife in this stratum, he cuts with a sawing motion circumferentially around the tire, thus removing a strip of tread and breaker 2½ to 3 inches wide. This operation is repeated a sufficient number of times to remove entirely the tread between lines on either side of the tire immediately at the bottom edge of non-skid, leaving the sidewalls intact, but skiving the top edges. The length of skive is determined by the edge design of camel back to be used.

Mechanical Tread Removal

Many of the higher production shops follow the knife cutting practice of tread removal in spite of its slowness because there is less danger of disrupting portions of the top ply fabric. Some shops, however, that advocate fast custom service feel that they can ill afford to be without rapid mechanical means of removing treads. Several types of machines[2] are available that can be used as buffers by substituting a wire brush for the rotary rasp.

James C. Heintz & Co.

Hand Cutting Tread

Mechanical tread removal consists, briefly, of hanging the casing on the rollers of adjustable tire rest and locking this mechanism with the tire tread firmly against the rotary rasp. The casing will be spun by the whirling rasp, but when retarded by the operator to obtain a differential speed, the tread is rapidly ground away. Tilting the tire by hand or by means of tire rest adjustments permits removal to the desired line of the sidewall.

Tire building machines are sometimes fitted with an expanding spider, each spoke of which terminates with a short section of a wide tire rim. These are expanded into the bead circumference of the tire, thus firmly mounting it on the machine.

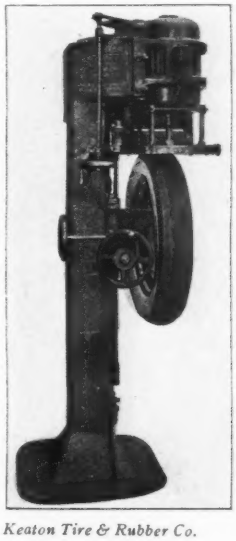
By forcing a heavy awl, held from lateral movement in sturdy metal guides, through the tread edge of the spinning tire and following the carcass contour the operator removes the tread in one piece. This practice is attended with the likelihood of considerable damage to the top carcass ply, therefore, cannot be regarded as a recommended procedure.

Remove Breakers

The fabric breakers should be removed with the tread in all cases, whether passenger or truck tires and regardless of the method employed. Separations, not detectable, are too liable to exist between breaker strip and carcass; moreover the strength of the underlying cushion gum after the retreading cure may not be sufficient to prevent premature separation of the new tread in service.

Objects of Buffing

This operation, while not difficult to perform, requires attention to the matter of thoroughness as it constitutes the first step in obtaining dependable adhesion of tread to carcass. Buffing is done with a 2-fold object: first, to remove all remaining top cushion gum, foreign material, and dirt from the entire area to be cemented and recovered; second, to roughen every point on the surface of that area, whether fabric or cured rubber, thus properly preparing it to receive cement.



Keaton Tire & Rubber Co.

Tire Tread Cutting Machine

Buffing-Cement Relation

The holding power of rubber cement is more dependent on the surface exposure of the area to which it is applied than to the degree of stickiness of the cement itself. It is quite generally

[1] See INDIA RUBBER WORLD, Nov. 1, 1934, p. 37.
[2] INDIA RUBBER WORLD, Oct. 1, 1934, pp. 36-37.

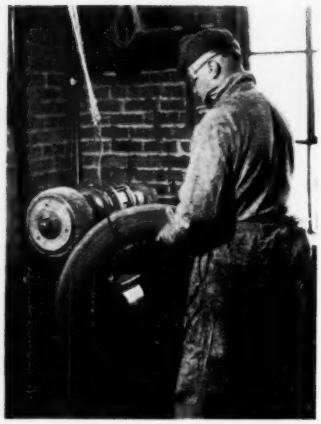
known that even the best grade of rubber cement will not permit strong bonding of a rubber article to a glass surface; whereas it will cause almost inseparable bonding to a properly prepared rubber or fabric surface. The explanation resides mainly in the fact that a square inch of glass presents technically only one square inch of surface exposure to which the cement can cling.

A square inch of fabric or rubber, properly buffed, is, on the other hand, a veritable forest of tiny fibrous projections, each having considerable surface area; consequently the total surface exposure, unlike the glass surface, is many hundred per cent greater than the original area. In general the bonding strength of cement is in proportion to the surface exposure of the area to which it is applied.

Buff Uniformly

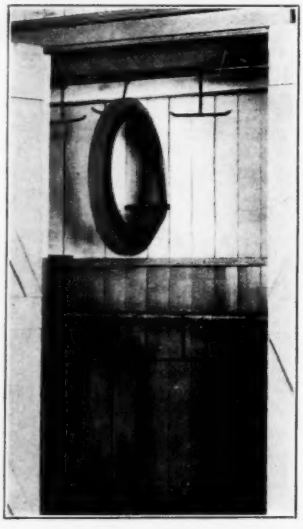
With this thought in mind the operator can better appreciate the value of buffing to produce a uniformly forested surface; that heavy buffing does not necessarily produce the best surface for strong bond; that unbuffed spots, even though perfectly clean, may pave the way for premature separations; and that buffing should always extend slightly beyond the area to be cemented to insure against an improperly prepared and therefore weakened job edge.

Power buffers of the stand or flexible shaft types, preferably the former, are suitable for retreading preparation. Whatever the type of machine, it should be fitted with a wire wheel as the fine wires cut and shred the surface, thus giving a more uniform foresting effect than that produced with coarse rasp-like attachments.



James C. Heintz & Co.

Buffing Detreaded Tire



Carcass and Cement Drying Room

Heat-Dry Carcasses

The casing is now in the best condition for proper and thorough drying. If time permits, all casings should be placed in a dry room at approximately 115° F. for 24 to 48 hours. Those having had treads or sidewalls cut, worn, or broken through to the fabric should without exception be dried. It should be kept constantly in mind that fabric wicks-up moisture, and while approximately 7% is normal, more can be and usually is present; yet the fabric may not feel damp. One's judgment cannot be relied upon in this matter; therefore it is safe practice to assume that all carcasses are wet enough to cause at least hidden trouble when the moisture is being rapidly driven from the carcass during the later curing process with its high temperature.

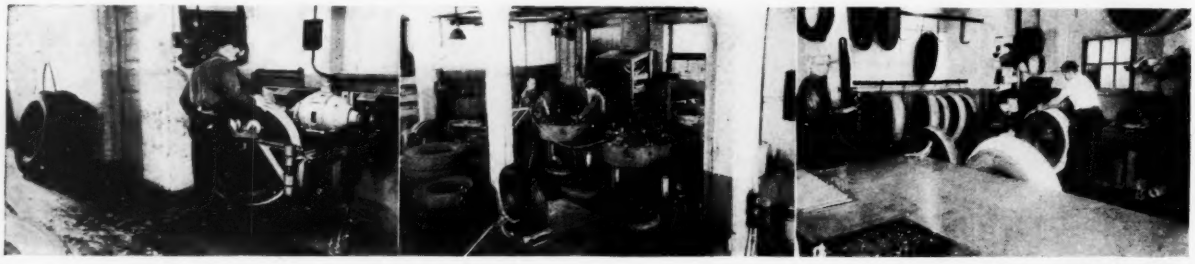
Rubber Insulations[1]

MASSES like vaseline, colophony, beeswax, paraffin, ozokerite, when used to coat rubber insulated wires, cause a marked increase in the electrical conductivity of the rubber and a corresponding decrease in insulating power. Of the above substances, ozokerite gives the most favorable results. Montan wax and bitumen, on the other hand, show no noticeable adverse effect except when combined with any of the first-named materials. The higher the temperature at the time of coating and the longer the duration of this process, the more marked is the deterioration. Compounding rubber with tetramethylthiuram disulphide at first gives a favorable result, especially with brief periods of soaking, but after some weeks the insulating resistance drops rapidly and in the end is frequently even lower than that of other rubber mixes.

The cause of the increase in conductivity seems to be connected with swelling phenomena.

While the decrease in insulating power caused by resinous and wax masses is of little importance for many electrotechnical purposes, there are other cases, for instance in Pupin coils, where this causes trouble. Lately a patent has been applied for for a special rubber insulation for Pupin coils which is said to be practically insensitive to the action of the insulating masses mentioned.

[1] W. M. H. Schulze in *Kautschuk*, Sept. 30, 1934, pp. 143-144.



Buffing **Curing** **Building**

The Goodyear Retreading Plant and School, Newark, N. J.

Prepare Injuries

At this stage the outer surface of the detreaded carcass should be examined for injuries that were not observable in the original inspection owing to the presence of the old tread. These injuries usually will be confined to nail-holes, small cuts, or spots of broken cords extending only part way through the carcass. Practically all such injuries can be prepared for repair by merely cutting away any loose or frayed edges, then cleaning and roughening with suitably shaped flexible shaft buffer attachment.

Annals of Rubber[1]

Chronological Record of the Important Events in the History of Rubber

1833. Charter obtained for The Roxbury India Rubber Factory, at Roxbury, Mass., the first company organized in the United States to manufacture india rubber into waterproof clothing, etc. The charter follows:

"Be it enacted . . .that LEMUEL BLAKE, LUKE BALDWIN, EDWIN M. CHAFFEE and CHARLES DAVIS, JR., . . . be, and they are, created a body corporate, by the name of the Roxbury India Rubber Factory, for the purposes of manufacturing, at Roxbury, in the county of Norfolk, india rubber cloth and leather and other india rubber goods . . . approved February 11, 1833."

Previous to this organization John Haskins, E. M. Chaffee, and Luke Baldwin had long been experimenting at covering cloth with caoutchouc, in a small building on Dudley St., Roxbury, and with a spreading machine of Chaffee's invention.

The new company was started with a capital of $30,000, increased to $240,000 in 1834, and to $300,000 the year following. Besides clothing it manufactured shoes, life preservers, coats, carriage traces, etc. During 1836 the company made for the United States Government the first pontoons constructed of unvulcanized rubber, as well as machine belting, and in 1837 the firm manufactured a large number of umbrellas out of muslin coated with india rubber; but, as Mr. Goodyear says, "owing to the adhesiveness and decomposition of the unvulcanized gum, the manufacture had to be abandoned."

During 1833 and 1834 Mr. Chaffee had been granted United States patents for making india rubber hose and mail bags, as well as for improvements in the manufacture of boots and shoes.

The company failed, 1839-40, but its title was continued until 1844, when it was changed to that of The Goodyear Manufacturing Co., and in 1845 the business was incorporated under the name of The Boston Belting Co., formerly located in Roxbury.

It may be well here to note that E. M. Chaffee, in his sworn statement of August 15, 1850, attributes the cause of the failure of the Roxbury Factory, as well as of the other rubber companies then operating in and about Boston, to "a want of knowledge of the method of curing india rubber so as to be impervious or insensible, to cold or heat, and so as to resist the effect of the essential oils and animal perspiration. The knowledge of the art of thus curing and preparing india rubber was obtained by Charles Goodyear, who invented it some years later."

1833. RUGGLES (Nathaniel) and BREED (Samuel D.) obtain separate United States patents for attaching soles to boots and shoes by means of caoutchouc.

1833. BARNARD, of Greenwich, discovers *caoutchisine* (caoutchoucine), "a solvent not hitherto used in the arts," while trying to coat cables and ropes with caoutchouc. He found that when the last-named substance is exposed to a temperature of 600° F., it resolved itself into a vapor which, when condensed, possesses the property of dissolving india rubber in large quantities.

1833. HOOD (J. M.) exhibits, at the Fair of the American Institute, a number of india rubber boots, made in New York, but which had been sent to South America to be varnished with the fresh juice of the caoutchouc tree.

1834. MARR (W.) obtains an English patent for lining safes with asbestos.

1834. JONES (Dr. Alexander), of Mobile, Ala., exhibits a description of carpeting, made by applying india rubber varnish to canvas previously covered with wall paper.

1834. MACKIE (Dr. Patrick), of New York, obtains a patent for the covering of ropes, which are likely to be exposed to the weather, with india rubber dissolved in the purified naphtha of coal-tar, or in such substance as possesses the property of dissolving caoutchouc.

1834. COOPER (George Duncan), of New York, is granted a patent for "the application of gum-elastic sheets . . . to vessels and roofs of buildings to prevent their leaking . . . "

1835. SIEVIER (Robert William) obtains, December 7, an English patent for elastic waterproof cloths or fabrics having surfaces either of fibrous matter, of various colors or of corrugated design, similar to morocco, etc.

1835. ATKINSON (William) obtains U. S. patent, October 6, for process of cutting caoutchouc into shreds.

1835. HANCOCK (Thomas) is granted his seventh English patent "for an improvement in rendering caoutchouc airbeds, cushions, pillows, etc., more elastic and capable of yielding more uniformly to the pressure of the body."

1835. Organization of the Eagle Rubber Co. at Woburn, Mass., which failed during the financial panic of 1836-37, and whose factory was taken by Nathaniel Hayward, that he might complete there his experiments as to the treatment of india rubber with sulphur.

1835. GOODYEAR (Charles), who had during the previous 5 years been experimenting with india rubber, finds a new method of dissolving it in turpentine spirits, as shown in the following extract from letter of Prof. L. D. Gale, of the New York College of Pharmacy, under date September 1, 1835:

" . . . The gum, reduced to the consistence of stiff paste by means of common spirits of turpentine, which requires no purification, is again restored to its original elasticity and imperviousness. The viscous or adhesive property which belongs to the gum in its natural state, and which is increased by the solvents generally used, has heretofore presented all the obstacles to the success of the manufacture and uses of this article. The process of Mr. Goodyear, by which this difficulty is removed, depends on chemical principles, which are fixed and invariable, and there seems to be no possible obstacle to its practical application."

Of this new method, which it was not then deemed advisable to make public, Prof. B. Silliman, of Yale College, thus wrote a few months later: " . . . a process by which he dissolves caoutchouc with common spirits of turpentine; and then by another process he restores it again, so as to form a thin sheet, or fabric, without tissue. This fabric is divested of the clammy qualities that exist

(*Continued on page* 42)

[1] Continued from INDIA RUBBER WORLD, November 1, 1934, p. 43.

Measurement of Quality in Rubber Goods by Physical Tests[1]

Arthur W. Carpenter[2]

THE following concludes the entertaining and helpful article on physical testing published in our November issue.

Laboratory Tests

Some pictures of laboratory testing which follow are shown, not with any idea that they may serve as shining examples of perfect mechanical analysis or as the last word in quality measurement, but merely that they may be suggestive as to the modern trend of test development and may illustrate the simplicity of the mechanical movements at present utilized in developing performance tests. As has already been suggested, the details of such tests are extremely varied but the fundamental mechanical principles are not nearly so diverse as appears at first glance. Figure 1-A shows a machine test for adhesion or "friction pull." The specimen in this case is a strip of transmission belting one inch in width. This test involves simply the measurement, by means of a pendulum dynamometer head, of the force required to separate plies of the specimen under standardized conditions. As has been frequently pointed out in the literature, the correlation of such tests as this with service performance is extremely unsatisfactory. Figure 1-B, however, shows a test in which the service correlation is very positive. In this case the deflection of a rubber bearing is being measured under various compressive loads applied to a shaft by means of a universal testing machine.

As has been suggested, performance tests which appear to be very good imitations of service conditions often fail to give satisfactory service correlation, probably because of failure to include in the test the essential characteristics of the actual service. Figure 1-C illustrates such a case. This machine was designed to test tread wear, using as test specimen a small pneumatic tire which is run on a rotating track made of standard road concrete. The test is of the angle-slip type, and provision is made for control of the angle. The speed can be varied as well as the dead-weight load supported by the tire. The road wheel is the driven member and in turn, through contact, rotates the tire wheel which is mounted as an idler on ball bearings. The amount of tread wear is measured by accurately calipering the depth of the nonskid grooves. For a time it appeared that this test would correlate very reliably with actual road service, but, as often happens, it was necessary only to test a sufficient number of tires to encounter serious reversals.

In Figure 1-D is shown a view of tire testing on Sprague dynamometers. In such tests a generator is driven by a motor through controlled contact of tire and road wheel. The actual horsepower expended on the road wheel is measured by weighing the generator torque and measuring the speed, using the Prony brake formula for the calculation. These tests have been quite reliably correlated with actual service for the evaluation of tire carcass performance. Figure 1-E shows a rather obvious but useful impact test known as the "guillotine test." This has given valuable information concerning the ability of tires to withstand service conditions. In this case the impact member is dropped between guides from controlled heights in an elevator shaft, striking a blow of known force on an inflated tire, properly mounted.

Another device for impact testing, as shown in Figure 1-F, has been successfully used for the testing of rubber-covered metal plates, such as are used in lining chutes, grinding mills, etc. In this device a chain elevator raises a 50-pound weight carrying a hemispherical impact surface to a predetermined height at which the weight is tripped from the elevator. The heavy body falling freely between nearly frictionless guides strikes a blow of known force on the specimen placed below on a suitable solid support. A very interesting result was observed with this apparatus while testing sheets of rubber which had been bonded firmly to metal backing.[3] Certain specimens, when tested dry, required approximately 100 blows before complete failure, which was taken as the number of impacts necessary to cause the rubber to tear apart sufficiently to expose the metal base. In appearance the failed sample showed a very roughened surface over a circular area of diameter about equal to that of the impact ball. At the center of this area a circular hole of small diameter extended down through the rubber to the metal. When the experiment was repeated, with the difference that the surface of the rubber was kept wet with water, failure took place after 3 or 4 blows. Irregular radial cracks extended from the center of percussion outward, and there was no appreciable roughening of the surface. Apparently the water acted as a lubricant, concentrating the full force of the blow at the center of percussion rather than permitting the energy of the blow to be dissipated through a larger volume of rubber by means of friction.

Figures 1-G, H, I, J, and K, show applications of flexing tests to various rubber products. Such tests can seldom be correlated directly with service performance, but they are extremely useful for comparative purposes. The machine illustrated in Figure 1-G is used with rubber strips or dumbbell specimens and is similar to the De-Mattia flexing machine.[4] A cross-head is driven by an eccentric at controlled variable speed. By using suitable settings of the clamps, it is possible to flex the rubber samples in bending only, as shown, or in extension. In

[1] *Ind. Eng. Chem.*, (Anal. Ed.), Sept. 15, 1934, pp. 301-308. Presented before the meeting of the Chicago Group, Rubber Division, A. C. S., Apr. 12, 1934.
[2] B. F. Goodrich Co., Akron, O.
[3] Sargisson, Z. E., B. F. Goodrich Co., unpublished work.
[4] Somerville, A. A., *Trans. Inst. Rubber Ind.*, 6, 141 (1930).

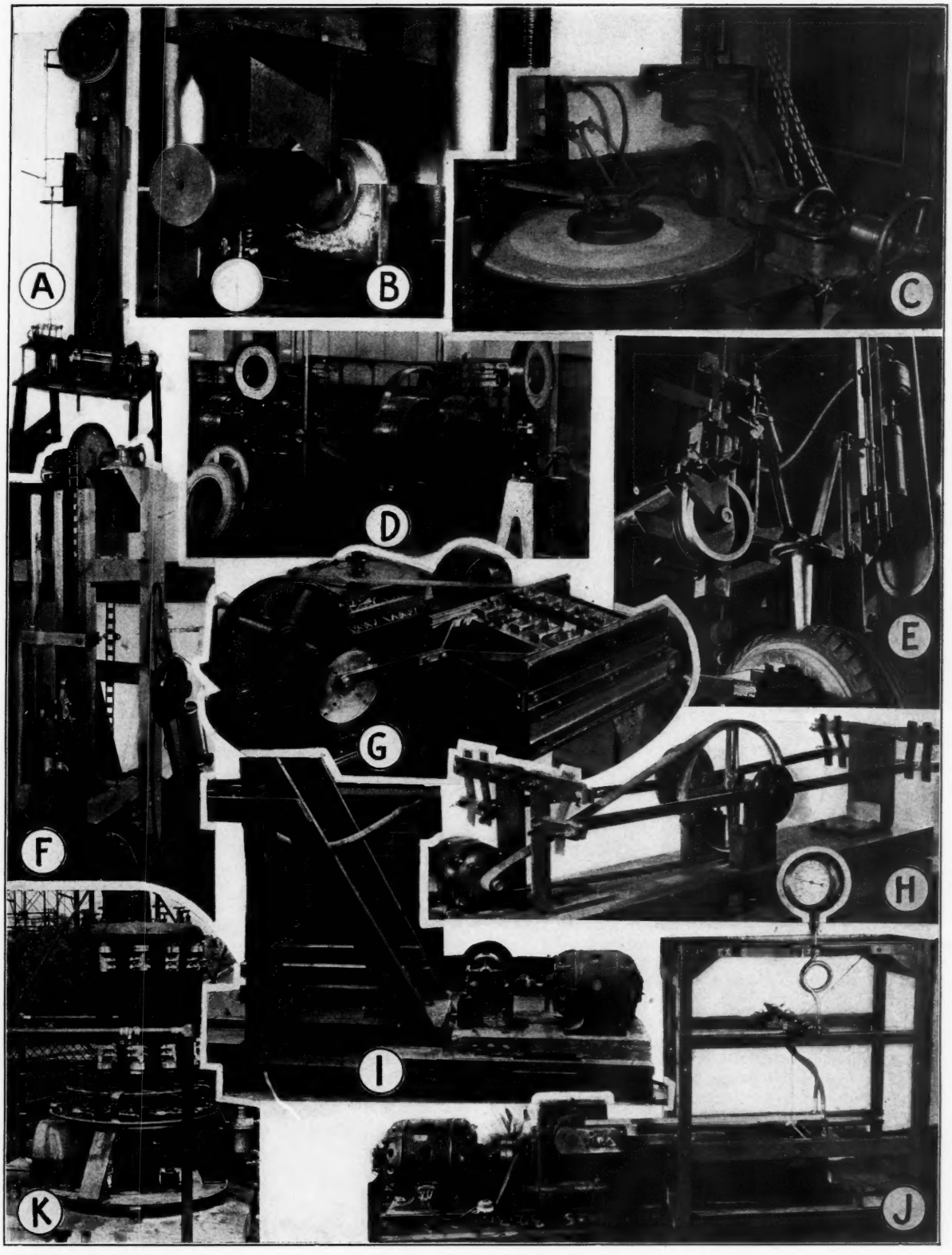


Fig. 1. Laboratory Physical Testing Machines

either case the first sign of failure will be the development of small cracks which finally lead to a complete rupture of the specimen. Figure 1-H shows a bending fatigue test on soling stock. This differs from the previous test in that the specimens are under slight tension produced by the weight of the driving arms which are

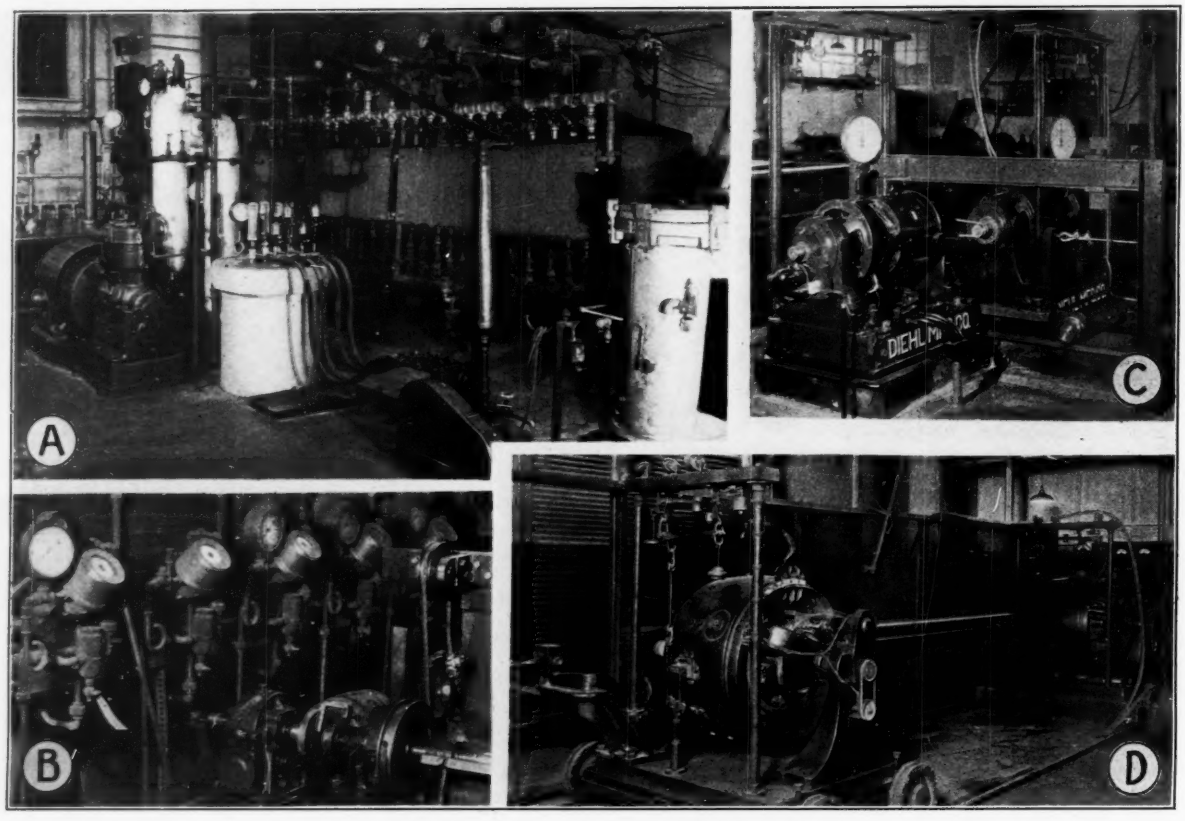


Fig. 2. Laboratory Physical Testing Machines

supported by the specimens. In Figure 1-I the performance relationship is more clearly defined, for in this case a specimen of gasoline hose full of the liquid is bent back and forth until the tube fails and the gasoline penetrates into the body of the hose. Figure 1-J shows specimens of grease-gun hose filled with grease under high pressure, which are flexed with a reciprocating motion until failure and consequent release of the pressure take place. Figure 1-K shows a recent performance test for steam hose. In this case the lower platform moves with an eccentric motion, causing the lower end of the hose specimen to be rotated in a circle about 4 inches in diameter. During test the hose is subjected to internal steam pressure of 250 pounds per square inch and external action of the weather. It is thus quite typically a performance test imitating actual service conditions as encountered by railway steam hose.

Another performance test, in which a rather elaborate attempt is made to duplicate on a laboratory scale a complicated set of service conditions, is shown in Figure 2-A. In this case service life of 4 samples of pneumatic tool hose is being compared. The apparatus consists of an air compressor which discharges into a receiver through equipment arranged to give constant temperature and pressure in the receiver. The compressed air from the receiver flows through the hose specimens after having received a known addition of lubricating oil at the receiver outlet. The compressed air is released from the hose through a valve mechanism which duplicates the impulse action of a pneumatic hammer. The test may be accelerated by raising the temperature and pressure of the compressed air. Figure 2-A also shows a steam rack and a digester which are used for heat deterioration tests of hose specimens.

In Figure 2-B equipment for testing steam valve disks is shown. A valve installed in a high-pressure steam line contains the disk under test, and mechanical arrangements are provided whereby the valve is opened by a motor which raises a weight at the same time. The mechanism then trips, and the falling weight closes the valve, assuring duplicate force conditions at each closure.

Figures 2-C and D show dynamometer equipment for testing belts. Both of these sets are so arranged that very complete information can be secured. In each case one dynamo is mounted on a track which permits control and measurement of the total tension on the test belt. In each set both dynamos are cradled and equipped for torque and speed measurement so that the actual pulley horsepowers can be calculated excluding the dynamo losses. In each case one dynamo operated as a motor drives the other dynamo as a generator through the belt. Knowing the pulley horsepower in each case, the power transmission efficiency is determined. The effective power load can be regulated by means of adjusting known resistances in the generator discharge circuit. With a given total tension on the belt, it is possible to use so much resistance that slippage of the belt occurs as would be evidenced by the readings of the revolution counters on the units. The set shown in Figure 2-C was recently designed for testing small V-belts at high speeds. It is capable of being operated continuously at speeds up to 5,000 r.p.m. with power loads of 25 h.p. The set shown in Figure 2-D, similar to that previously described by Sturtevant,[5] is capable of handling 100 h.p. at speeds up to 1,800 r.p.m. It is suitable for use with full-size power-transmission belting of either flat or V-type.

[5] Sturtevant, W. L., India Rubber World, 83, 68 (Dec., 1930)

Rubber Paints

Joseph Rossman, Ph.D.

THE following abstracts of United States patents conclude the interesting and informative article on rubber paints continued in our November issue.

119. Geer, 1,744,881, Jan. 28, 1930. The paint of the invention embodies a tough, non-friable, heat-plastic rubber isomer having a less chemical unsaturation than rubber, a specific gravity of approximately 0.97 to 1.00, and a softening temperature (tensile method) of from 55° to 105° C. This product is made by admixing with 100 parts by weight of rubber approximately 7½ parts by weight of phenol sulphonic acid, and heating the admixed mass, as for example, in an oven for 6 hours at 140° C.

One example to make a paint follows. Take 96 parts by weight of the tough rubber isomer and add as antioxidants 3 parts of aldol alpha-naphthylamine and one part of benzidine, and as a filler 287 parts by weight of barytes. The ingredients after being thoroughly admixed upon a roll mill are dispersed in an organic solvent, such as toluol, gasoline, benzol, turpentine, by stirring in a paint mixer. The nature and the amount of solvent employed vary to some extent with the desired consistency of the paint.

Where it is desirable to provide a clear paint or varnish instead of the opaque fillers, use 10 parts of transparent or translucent fillers as drying oils, waxes, resins, mineral rubber, and the like. A paint comprising the rubber isomer 96 parts aldol alpha-naphthylamine 3 parts, benzidine one part, and linseed oil 10 parts, dispersed in an organic solvent, such as benzol, has excellent properties as an outer finish or gloss coat. Where greater body or color is desired, pigments may be added to the recipe of this example in amounts varying from 10 to 70 volumes of pigments to 100 volumes of the rubber isomer.

A high-quality paint may be prepared from an admixture of the rubber isomers. Thus, 52 parts by weight of a tough non-friable rubber isomer, 46 parts by weight of a hard, grindable rubber isomer, 2 parts by weight of antioxidants, 100 parts by weight of lithopone are thoroughly admixed and then dispersed in an organic solvent in the approximate proportion of one pound of the rubber isomer to one gallon of the solvent. This produces an ivory colored, heavily pigmented paint of great covering power which adheres to metallic surfaces with unusual tenacity.

Baking paint is obtained by mixing the non-friable rubber isomer 96 parts by weight, antioxidants 4 parts by weight, fillers 10 parts by weight, to which is added a drier, such as manganese linoleate, lead resinate, manganese resinate, or cobalt acetate, and dispersing these ingredients in an organic solvent in the manner above described. When spread upon a metal surface and then baked in an oven, a hard, adherent protective film is formed.

120. Gibbons and Binmore, 1,745,533, Feb. 4, 1930. A process for making a hard rubber varnish comprises mixing finely divided vulcanized rubber in boiling solvent naphtha having a boiling point of 160 to 170° C. approximately at atmospheric pressure, stirring the mixture until the rubber is dissolved, adding sufficient sulphur to produce a vulcanized rubber having a combined sulphur content of approximately 32%, and heating the solution and sulphur to approximately the boiling point of the solvent naphtha to produce a free flowing vulcanized hard rubber solution containing substantially 32% of combined sulphur and substantially no free sulphur.

121. Bleecker and Clark, 1,750,087, Mar. 11, 1930. A base for chemically resistant and dielectric paints consists of 81% raw rubber, 9% sulphur, and 10% of an oil adapted to dissolve vulcanized rubber.

122. Coolidge and Holt, 1,863,834, June 21, 1932. The invention relates to a non-caking pigmented coating composition. The following is one example given. These constituents are thoroughly mixed together: 5% solution of rubber in gasoline, 11 parts by weight; ethyl alcohol, 6.1 parts by weight; butyl acetate, 1.3 parts by weight; toluol, 2.3 parts by weight; dammar gum, 6.1 parts by weight. The Titanox pigment is then added in the proportion of 55 parts, mixed until uniformly incorporated, and the whole is then ground in a pebble mill for 12 hours. Let us call this mixture base "A."

The remaining constituents are mixed in a separate container as follows: butyl acetate, 16 parts by weight; ethyl ether of ethylene glycol (cellosolve), 10 parts by weight; butyl alcohol, 10 parts by weight; ethyl alcohol, 7.9 parts by weight; gasoline, 3.4 parts by weight; toluol, 4.2 parts by weight; dammar gum, 3.9 parts by weight; nitrocellulose (½-second viscosity characteristic), 10 parts by weight; dibutyl phthalate, 4 parts by weight. Let us call this lacquer admixture base "B." Base "A" is then run into base "B" with efficient agitation, following which the lacquer is adjusted to suitable brushing viscosity with butyl acetate.

Modifications of Example 1. The pigment may be thoroughly mixed with the gasoline solution of rubber prior to adding the remainder of the grinding vehicle. Any suitable rubber solvent system may be used in place of gasoline, and, if necessary, the solvent may be partially or completely removed by filtration or evaporation before incorporation with the grinding constituents. Another method consists in incorporating the pigment with the grinding vehicle before the rubber solution is added. Another method consists in adding the rubber solution at some stage of the grinding operation. A still further modification consists in incorporating the rubber solution by mixing it into the grinding base following the grinding operation. Another modification consists in the dry milling of the pigment with the protective agent without using any diluent or solvent for the agent, and this will be followed by the incorporation of the grinding constituents.

Example 2. The rubber may also be incorporated with the pigment prior to contact with any constituents of the lacquer vehicle, as follows. The pigment is slurried in water in the ratio of 3 parts of water to one of Titanox and there is added with strong agitation a small amount of an aqueous solution of rubber latex; ½% to 1% of rubber by weight on the basis of the pigment will usually suffice. The mixture is agitated thoroughly to allow for uniform adsorption or incorporation of the

rubber on the pigment. The pigment is then filtered, dried, and used in the normal manner in the preparation of a nitrocellulose lacquer, as in Example 1 above.

123. Plauson, 1,900,663, Mar. 7, 1933. The process of producing rubber lacquers and varnishes comprises heating rubber, a vinyl compound, and acetic acid in the presence of trinitrophenol together with a volatile hydrocarbon, thereby causing the dispersion of the liquefied vulcanized rubber. The following is a specific example. One hundred parts of rubber are dissolved in 900 parts of benzine, and ½ to 1% of symmetric trinitrophenol is added. Thereupon the mixture is carefully heated in an autoclave to 125° C. for one hour to 2 hours and then for ¼- to ½-hour to 150° to 180° C. After filtration a liquid varnish-like mass is obtained which can be very easily brushed on and can be used as a first-class binding agent for pigments and lacquers. From 5% to 20% of vulcanized rubber can be added in the shape of lacquer or varnish to any desired filling materials to produce plastic masses. By the addition of ½% to 1% of a super-oxide, e.g., sodium-super-oxide, the period of vulcanization and the temperature can be decreased. If it is desired to obtain a harder product, polymerizable or polymerized vinyl compounds, e.g., vinyl acetate, chlorine- or bromine-vinyl compounds are added and together with the rubber are subjected to vulcanization. The amount of these additions depends on the desired solidity and hardness.

124. Trumbull and Howard, 1,906,437, May 2, 1933. A metal coating composition comprises approximately 200 parts by weight of hard rubber dust and a solution of 100 parts of a heat-plastic rubber isomer in benzene.

125. Schmidt, 1,950,820, Mar. 13, 1934. A varnish adapted to provide a hard, adherent, shock resistant, ornamental, and protective coating to a surface to which it may be applied comprises a mixture of a solution of chlorinated rubber in a volatile solvent, and pulverized carborundum having a grain size of 40 to 100 μ.

126. Koch, 1,950,894, Mar. 13, 1934. A coating composition for metal contains chlorinated rubber, a chlorinated diphenyl, a resin, a drying oil, and a solvent.

127. Mano, 1,960,250, May 29, 1934. An anti-fouling coating composition is made by dissolving cholesterin, resin, and a coagulated lactiferous plant exudate in suitable solvents, evaporating the solvents, powdering the residue, dissolving it in a suitable solvent, and adding a toxic.

128. Mano, 1,960,251, May 29, 1934. An anti-fouling paint which does not become brittle when dry, but which remains yieldable and impervious to water friction, which repels marine life and adheres well to all types of surfaces and can be applied to wet surfaces, comprises substantially 25 parts by weight of the lactiferous exudate of the Euphorbia lactea, 5 to 10 parts of cholesterin carried by the same quantity of a fatty vehicle for the cholesterin, a water soluble toxic dissolved in water, and a solvent.

129. Mano, 1,960,253, May 29, 1934. To make an anti-fouling paint melt together a resin and rubber gums, add lanolin to the compound after it has been fused, and add a water soluble toxic in the presence of any moisture absorbed by the lanolin to distribute the toxic throughout the paint and to make it available for absorption by marine life.

130. Larsen, 1,963,497, June 19, 1934. The method of conditioning paint, to acquire hardening properties after being applied, consists in adding to and mixing with an oil paint a compound of boiled turpentine and liquid rubber, oxide of zinc, and denatured alcohol, the compound added to the paint in about the proportion of 3 tablespoonfuls to each pint of paint.

131. Melvin, 1,970,704, Aug. 21, 1934. A composition comprises rubber, cellulose nitrate, a solvent medium for the rubber and cellulose nitrate, and as a plasticizer, an ester from the group consisting of butyl, amyl tetra-hydrofurfuryl, lauryl, fenchyl, and ethoxy ethyl stearates, ethyl palmitate, lauryl laurate, and cyclohexyl oleate.

Para-Graphs

SELF-CONTAINED PRECISION VULCANIZER. Platen presses equipped with individual hydraulic pressure generating devices, electrically heated plates, automatic temperature and time controllers, and constructed for precise dimensional work have been recently designed for rubber printing plate vulcanization. Equipment of this character will doubtlessly captivate the interest of rubber manufacturers when it is realized that the installation time requirement and expense is comparatively very low; that particular dimensions can be regularly obtained in laboratory test pieces as well as in numerous very exacting commercial molded items; that cleanliness to a degree, heretofore impossible, is easily obtainable because the hissing, dripping, dirt catching, greasy steam, drain, and hydraulic pipes and fittings that normally cob-web the pressroom are entirely eliminated; and that one or all such vulcanizers can be operated whether boilers are operating or not.

CLONE RUBBER PROPERTIES. Clone research indicates that a decided uniformity of quality exists in latex as well as rubber coming from the various individuals within a given clone, a condition that is by no means true with seedlings. Bulking or averaging practices in latex compounding may eventually, with advantage, give way to clone latex specification.

ZINC OXIDE. The variety and types of lead-free zinc oxide have greatly increased in the past few years. Comparatively few grades of lead-free zinc oxide were formerly available. Most manufacturers have a number of grades varying in color and particle size and of slightly different chemical and physical characteristics. Many consumers in the same industry specify widely different requirements on zinc oxide. The ability of the producer to meet these different requirements reflects favorably on the flexibility of his processes and the exactness of their technical control.

TEMPERATURE CHANGES RUBBER FORMS. Crude rubber cooled slowly stiffens or crystallizes, but when cooled quickly, its elastic form is retained. The crystalline form has 2 to 3% less volume than the ordinary form and reverts to ordinary form over a spread of 6 to 16° C. instead of at a definite temperature. Both kinds have derivative forms at 73° C., of lower expansion coefficients than their parent forms. The temperature-volume measurements of these forms have a close correlation to heat capacity, dielectric constant, and stretching behavior. Vulcanized rubber does not crystallize although it takes another characteristic form near -73° C.

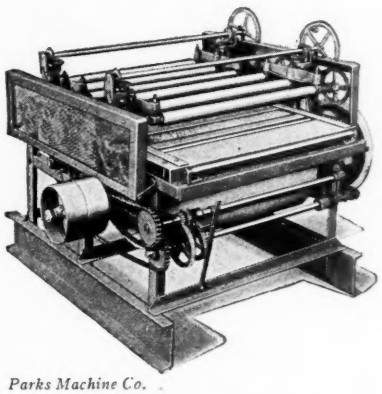
SHEET RUBBER WITHOUT MILLING. A method of

(*Continued on page* 44)

Cutting Rubber Tile

W. E. Swanson

A GREAT deal of debate has been going on as to which is the most economical method of cutting rubber tile and the machinery to be employed. When rubber tile is to be vulcanized, any type of multiple heel press or belt press can be used. The corrugation that is desirable for the bottom surface of the tile so that it will adhere to the underbed can be made by serrating the top mold or by laying a heavy piece of canvas ducking on the top of the rubber sheeting which is pressed into the rubber when vulcanized. This can be ripped off after the rubber is finished, leaving a rough surface. There is always an uneven tendency that remains, regardless of how careful the operator may be to have the thickness even. A uniform thickness is very essential because high joints will show up on the floor.



Parks Machine Co.

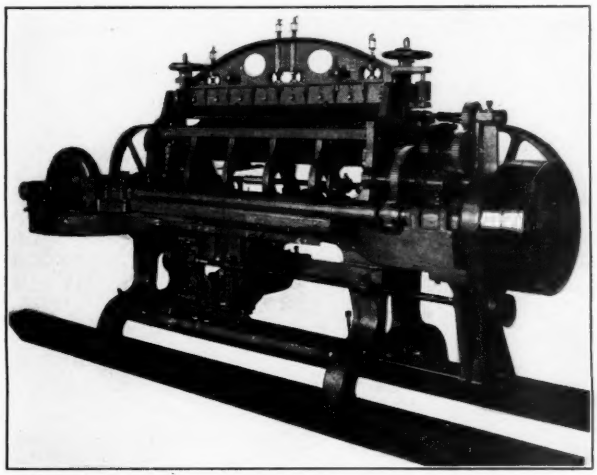
Fig. 1. Self-Feed Double Drum Sander

The method used by some manufacturers of rubber tile is to buff off the bottom surface to the proper thickness with a drum sanding machine similar to the type used in the woodworking trades. A double drum sander of a small type is shown in Figure 1. This type is inexpensive, but is not considered the best as it does not give accurate results.

A leather splitting machine that will cut exact thicknesses is considered superior as shown in Figure 2, and the principle of the operation is seen in Figure 3. Referring to this illustration, A is the sheet of rubber tile; B the direction of the movement of the sheet between the rollers; and C the belt knife. The knife blade may be stationary or movable. A belt knife blade operated in a slot and turning on 2 wheels similar to a horizontal band saw blade is considered the best.

Figure 4 is a side-dip shear paper cutter used for cutting rubber tile. This machine does not cut a perfectly vertical tile as the front of the knife cuts a protruding under bevel. In square tile the sheets are cut a little larger than the size required and then turned around so that the back of the knives will cut off the under bevel after the gage had been set for the proper size. This machine can be operated by foot or by hand. This type of machine has been used for cutting interlocking tile by removing the knife and inserting a die. An automatic device moves the sheet up to its proper place at each operation. The base and frame of this machine is cast in one piece, preserving alinement regardless of floor conditions.

An automatic clamp holds the pile of rubber tile firmly during the cutting period and until the knife rises above the pile of rubber tile after the cut is made. The knife has a speed of 40 cuts per minute. The requisite amount of pressure for piles of various heights is automatically applied without requiring thought or adjustment by the operator. An experienced operator on this machine, with the aid of differently formed jigs, can cut halves, quarters, or any desired shapes by a straight cut.



Woburn Machine Co.

Fig. 2. Splitting Machine

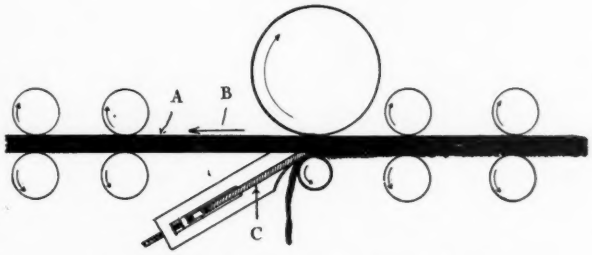


Fig. 3. Principle of Leather Splitting Machine

Figure 5 is a die press used for cutting what is known as male and female tile. It will also cut square tile. This machine cannot be used to cut any more than one thickness at a time without showing some discrepancy in different tiles. The waste on this cutter is left only from the outside of the die. This machine is also used for mastic tile.

Figure 6 is another machine, similar, but lighter than the one shown in Figure 4, which cuts only one thickness at a time, having a rule knife that leaves no waste from its cut except what is left over. It is very economical. In this machine a back gage is set square, and for various sizes different steel plates are inserted so that cutting a straight edge, which is the first thing to cut against

the steel filler plates, different sized squares can be cut. Two operators can manipulate this machine, one setting the rubber in front and another receiving the cut tile from behind. It is very important that at no time must a man insert his hand under the knife; he should always have a small stick handy, using precaution for safety. By setting or removing these steel plates, which action can be accomplished instantly, different tiles can be cut without delay. Speed of changing and cutting is essential to lower the cost of production. Two experienced cutters on this type of machine can cut from 3,000 to 7,000 square feet a day, depending on the size, naturally taking longer to cut 4-inch tile than 12-inch tile.

Figure 7 shows another machine that operates on an 8- by 8-foot bed moving from one side to the other. This apparatus has circular knives mounted on a shaft and spaced to the desired size, turning the strips around to cut the desired square. To cut a different sized tile the shaft has to be taken off and reset by different spacers, taking much time.

Small hand cutting machines have been devised, but they are used merely for small work or for emergency.

One inch or larger border strips can be cut on the same machines that cut tile. Tiles that show any sign of bloom should be discarded, also undercured or overcured, as well as any tiles that have blisters, holes, blotchy mottling, or are curled. Although cheap labor is used to manufacture tile, a man who is a good economical cutter is a great asset to any company.

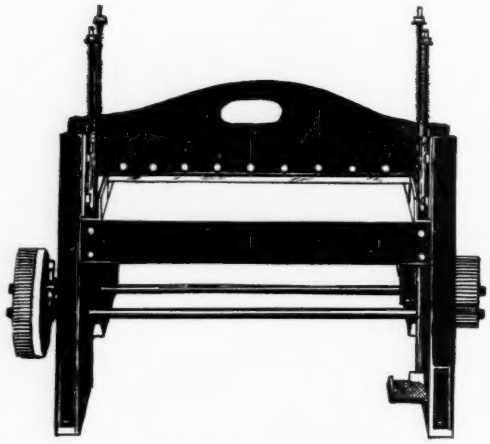


Fig. 6. Rule Knife Cutting Machine

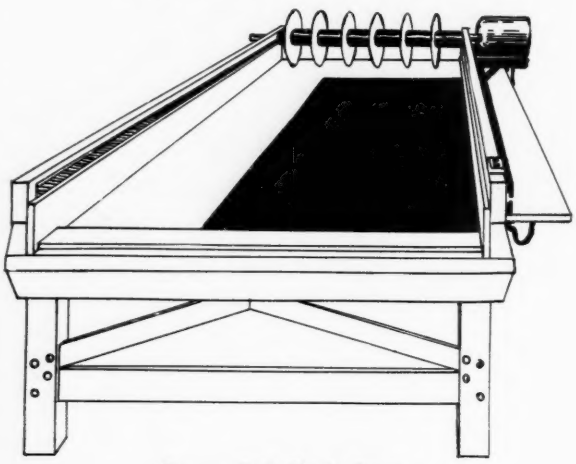
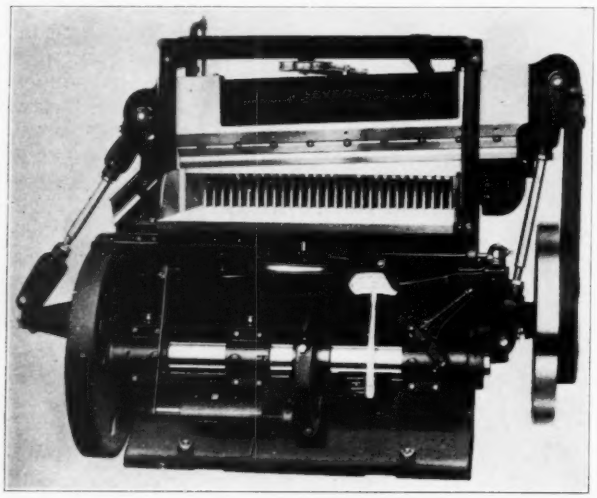
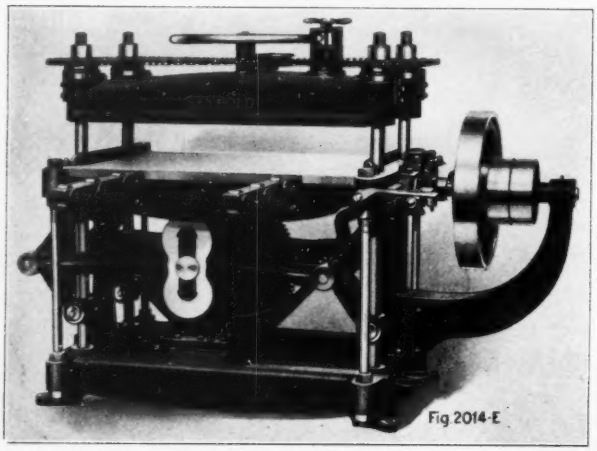


Fig. 7. Disk Knife Cutter



Seybold Machine Co.

Fig. 4. Side-Dip Shear Paper Cutter



Seybold Machine Co.

Fig. 5. Die Press to Cut Tile

Annals of Rubber

(*Continued from page* 35)

in the native elastic gum. . . . Mr. Goodyear has prepared his elastic gum in my presence, by spirits of turpentine, and then brought it back without mixing or blending any other substance with it, so that it becomes again strong india rubber, but free from any clamminess; and feeling, when pressed between the hands, like linen or cotton."

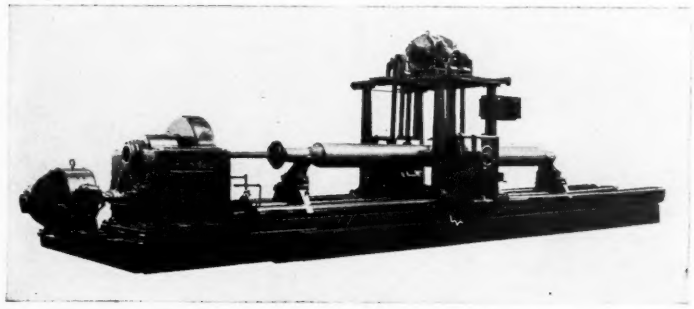
This result was achieved by "boiling the articles compounded with magnesia, in quick lime and water, which appeared to have the effect of tanning the gum, and destroying its viscous property."

1835. GOODYEAR (Charles) exhibits articles made by his novel process, and receives medals from the N. Y. American Institute, "for a new discovery in india rubber," and from the N. Y. Mechanics' Institute, "for a new method of manufacturing india rubber." During the ensuing year he is given other medals by the same institutions, "for india rubber drapery not liable to decomposition from exposure to the sun," and "for the application of india rubber to printing." (*To be continued*)

Rubber Roll Grinding

Wet and Dry Grinding of Paper Press Rolls

GRINDING and finishing is highly important, whether of metal or rubber rolls, because its accuracy directly controls that of the products calendered. The following on press roll grinding derived from an authoritative source[1] will appeal to foremen concerned with finishing rubber covered rolls for the paper industry or any other using rubber press or squeeze rolls.



Farrel-Birmingham Co., Inc.

42-Inch by 312-Inch 2-Wheel Swing Rest Roll Grinder

As for a lathe in which to do heavy roll grinding, the illustration represents one specially built for the work, equipped with a motor driven support for the grinding wheels and their movement along the face of the work.

Abrasive Wheels

Wheels for grinding rubber rolls are of coarse grit with elastic bond rather than vitrified bond. A wheel of that sort does not "load" in service. This term denotes the filling up of the spaces between the particles of abrasive and the surface of the wheel, giving it a smooth glazed surface.

The advantage in using different wheels is strikingly illustrated in the grinding of rubber covered rolls. The correct wheel, properly operated, prevents loading, overheating, and the necessity of dressing. On the average hard rubber roll a 30 grit, grade 4 wheel is preferred; while on soft rubber a 30 grit of a softer grade, such as 5 or 6, proves more satisfactory. On soft rolls some mills are roughing with a 30-6 and finishing with a 60-7 wheel, at the same time increasing the r.p.m. of the roll to give surface speed of about 150 feet per minute.

A loaded wheel can be cleaned by means of a sharp star dresser or a coarse abrasive stick, and by cleaning the wheel frequently with a stiff wire brush. Loading can be controlled to a degree by the use of some means of reducing the heat generated. This is accomplished by the use of air, water, or the interruption of grinding while the wheel cools. The generation of heat can be prevented by taking a very light cut and rotating the roll at a very slow speed or by the use of a coarse wheel. Narrow effective wheel faces with edges well rounded are recommended with a working speed of 7,500 to 9,000 surface speed per minute.

There is difference of opinion as to whether or not rubber covered rolls should be ground wet or dry. It is interesting to know, however, that the best results and the least trouble with wheels loading are obtained by dry grinding.

[1] "A Survey of Roll Grinding Practice in the Paper Industry." Farrel-Birmingham Co., Inc., Ansonia, Conn.

Dry Grinding

Several means are available for air cooling the wheel and the work in dry grinding. A steady current of air may be directed from a fan or blower so that it strikes the wheel and the roll with cooling effect. A second effective method is to adjust an air suction nozzle close to the grinding contact. For this purpose a portable vacuum cleaner does very well.

Where neither of these means is available, the grinding wheel itself may serve to afford ventilation. This is accomplished by using a wide-face wheel with the center of the face undercut in a wide U form. For example, a 2-inch face wheel can be undercut with a dresser in such manner that there are 2 faces presented, each ½-inch wide, the center having a clearance of ½-inch. This arrangement causes a down draft between the wheel and the work.

Wet Grinding

Wet grinding simplifies the cooling problem and has the added advantage of producing smoother grinding. Plain water serves as the cooling medium. It is well also that the edges of the wheel be well rounded to reduce the cutting area of the wheel and to prevent deep traverse marks. Heavy cuts should be avoided and a slow rate of wheel traverse be used. For finishing, the roll should be driven at the maximum safe speed and smoothed with aluminum-oxide coated cloth in 50 grit and polished with 150 grit cloth 30. In both cases the roll should be well covered with powdered soapstone during these operations.

An effective cooling mixture for wet grinding is prepared from a special compound using 16 quarts of water to one pound of the compound. In order to use such small proportions it is essential that the compound be well dissolved in a small quantity of warm water before being turned into the tank in the bed of the grinder illustrated.

Rubber Absorption

United States absorption during the first 9 months of 1934 was 353,000 tons—an increase of 37,000 tons over the figure for 1933. Deliveries to manufacturers and warehouses in the United Kingdom during this period amounted to 81,000 tons, showing an increase of 24,000 tons over the 1933 deliveries. Few data for net imports into the remaining countries during September, 1934, are available, but up to the end of August imports will probably be 35,000 tons greater during the first 9 months of this year than in the corresponding period of 1933.

Distributers' Tire Stocks

In the United States as of October 1, 1934[1]

THIS report covers stocks of tires held by both independent dealers and mass distributers, returns from these 2 groups being discussed separately below.

Independent Dealers' Stocks

The regular semi-annual survey of tire stocks in hands of dealers, conducted since 1924 by the Rubber Section, shows the following comparable statistics, as of October 1, for stocks held by independent retailers in 1934 as against 1933. The number of reports received from dealers having stocks of casings was 546 less than in October, 1933. The average number of automobile casings per dealer was 63.8 on October 1, 1934, compared with 61.3 a year previous.

DEALERS' STOCKS OF AUTOMOBILE TIRES

	October 1, 1933			October 1, 1934		
	Number	Dealers Reporting	Average per Dealer	Number	Dealers Reporting	Average per Dealer
Total casings	1,224,540	19,964	61.3	1,238,134	19,418	63.8
High pressure	118,209	12,025	9.8	123,682	11,887	10.4
Inner tubes	1,577,561	20,422	77.2	1,528,302	19,507	78.3
Solids, etc.	14,338	523	27.4	16,640	467	35.6

(NOTE: Statistics for total dealers and total casings in the above table for October 1, 1933, include 675 late returns not received early enough to be admitted to other tabulations.)

High pressure casings, including both passenger car and truck sizes, which accounted for 13.1% of total stocks reported October 1, 1931, amounted to 9.6% of total on October 1, 1933, and to 9.99% this year.

The following table compares average stocks per dealer reporting each item on October 1 in the years 1925 to 1934, inclusive.

AVERAGE STOCKS PER DEALER ON OCTOBER 1

	1925	1926	1927	1928	1929	1930	1931	1932	1933	1934
Total casings	56.6	49.9	57.6	64.8	68.4	62.4	60.2	71.3	61.3	63.8
Balloon casings	17.5	19.8	30.7	44.0	(a)	(a)	(a)	(a)	(a)	(a)
High pressure	(a)	(a)	(a)	(a)	22.9	14.5	11.3	12.0	9.8	10.4
Inner tubes	99.1	93.8	103.1	107.4	103.4	89.2	80.8	92.3	77.2	78.3
Solids, etc.	25.0	23.9	26.1	23.4	24.2	22.7	19.1	20.2	27.4	35.6

(a) Information not tabulated in survey indicated.

An analysis by volume groups has been prepared of the reports from dealers having stocks of casings, and a comparison made to similar data from the survey of October 1, 1933, as follows.

DEALERS CLASSIFIED BY VOLUME OF STOCK

	October 1, 1933			October 1, 1934		
	No. of Dealers	% of Total Dealers	No. of Casings	No. of Dealers	% of Total Dealers	No. of Casings
Less than 10	5,077	26.32	25,386	4,083	21.03	20,545
10— 24	5,627	29.17	89,818	5,461	28.12	87,964
25— 49	3,881	20.12	135,192	4,243	21.85	148,547
50— 99	2,544	13.19	174,048	2,978	15.34	205,509
100—199	1,200	6.22	162,756	1,504	7.74	205,322
200—299	370	1.92	89,587	499	2.57	118,838
300—399	191	0.99	64,905	235	1.21	79,965
400—999	283	1.47	168,739	321	1.66	188,264
1,000 and over	116	0.60	264,584	94	0.48	183,180
	19,289	100.00	1,175,015	19,418	100.00	1,238,134

Mass Distributers' Stocks

This section covers stocks reported by mail order houses, automotive supply chain stores, chains operated by certain oil companies which sell tires through numerous stations, and retail stores owned or controlled by the principal tire manufacturing companies. Complete reports were received from practically all the mass distributers circularized, but some oil company distributers were not included. The following table shows the stocks actually reported by these distributers on October 1, 1934, compared with figures secured in preceding surveys.

	October 1, 1932	October 1, 1933	October 1, 1934
Total casings	2,032,929	1,952,692	2,386,127
Inner tubes	2,109,690	1,935,830	2,302,167
Solid and cushion tires	2,285	4,720	2,870
High pressure casings	197,086	170,392	224,692

It is believed that the reports from mass distributers in the present survey were much more complete for this group than in previous surveys and it is estimated that their stocks of automobile casings on October 1, 1934, totaled 2,485,000 (2,473,000 on October 1, 1933) and stocks of inner tubes amounted to 2,400,000 (2,375,000 a year ago).

Summary

An idea of the true casings inventory position of the industry is given in the following statement, based on the assumption that 70,000 independent tire dealers were holding stocks at the date of each of the surveys of October 1, 1932, October 1, 1933, April 1, 1934, and October 1, 1934; plus estimated total stocks held by mass distributers; plus the inventory of tire manufacturers as reported by The Rubber Manufacturers Association, Inc. (raised to 100% at the Association's estimate of completeness). The statement is to be regarded as a sample of how such estimates may be made, not necessarily as a strictly accurate statement.

INDUSTRY INVENTORY OF AUTOMOBILE CASINGS

	October 1, 1932	October 1, 1933	April 1, 1934	October 1, 1934
Independent dealers	4,991,000	4,291,000	5,579,000	4,466,000
Mass distributers	2,300,000	2,473,000	2,140,000	2,485,000
Manufacturers	7,070,000	7,595,000	11,980,000	8,450,000
	14,361,000	14,359,000	19,699,000	15,401,000

[1] Special Circular No. 3,547, Rubber Section, Department of Commerce, Bureau of Foreign and Domestic Commerce, Washington, D. C.

Para-Graphs

(*Continued from page* 40)

making sheet rubber from latex without milling is accomplished in a tank made of aluminum or other suitable material, which differs from the ordinary tank in that the partitions are spaced ¼-inch instead of the usual 1½-inch interval. Also the partitions are stamped with an embossed pattern so that when the coagulum is taken from the tank, it is thin enough to dry satisfactorily and will be marked with an identifying pattern as in the case of ordinary sheet. Coagulation is effected by formic or acetic acid. The whole tank after washing and draining is placed into a drying chamber to harden the sheets before their removal. They are best dried by laying them flat on small mesh wire netting. Sheets have been made 10 by 20 inches that pack without folding.

The Silent Street Car

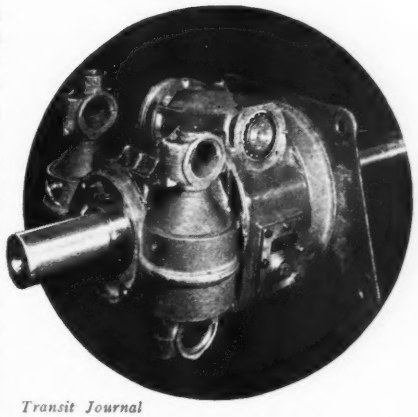
ENGINEERING research[1] covering 5 years has now culminated in the production of a lightweight, silent street car in the design of which special consideration was given to the comfort of passengers and reduction of noise, safety, speed, operating, and construction costs. In the items of comfort of passengers and reduction of noise great dependence has been placed on the use of rubber, particularly in the construction of the trucks where vibrations are effectually damped by rubber supports in shear.

The application of rubber in shear has been well developed and applied in designs for engine and machine mountings, cushion wheels, spring and shackles, and various other machinery joints. The accompanying illustration of plate form mountings shows the application of rubber in shear. The reason for this method of using rubber is because the material has much greater ability to absorb vibration in shear than when stressed in any other way. This permits a suspension that is comparatively stable in any desired direction and very soft, with a low natural frequency, in the direction of the vibratory thrusts. At the same time the hysteresis or internal friction of the rubber reduces the amplitude tremendously at resonance as compared with springs and damps out repeated oscillations to a very great extent. All kinds of vibration are effectively absorbed, and telephonic noise transmission is completely absorbed.

In the new type of trolley car full advantage has been taken of the shear application of rubber in the construction of the trucks to insulate vibration and noises from the car body. Two truck models have been designed. One of these together with detail of its rubber spring mounting is here illustrated.

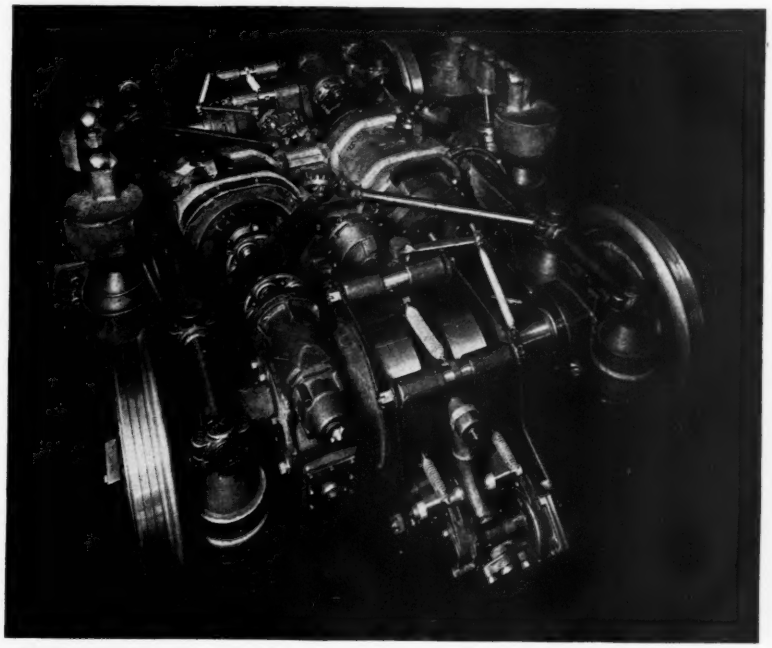
Both trucks are mounted on rubber cushion wheels which have steel treads carrying webs that are held in place in relation to parallel webs attached to the hubs by means of annular disks of rubber acting in shear.

The trucks are built up around the rubber springs shown in the detail illustration. Each spring consists of a tubular metal core surrounded by a cylinder of rubber which in turn is enclosed in a vertical metal cylinder. The illustration shows the method of supporting the axle of a truck. The tubular side frames are held in the bearings at the top and bottom of the rubber spring housings.



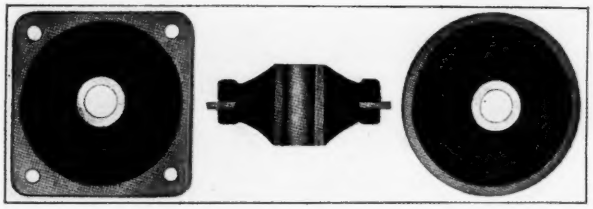
Transit Journal

Detail of Rubber Spring



Transit Journal

Model A Truck Mounted on Rubber Cushion Wheels



Lord Mfg. Co.

Application of Rubber in Shear

The advent of the silent trolley car bids fair to restore public interest in that mode of passenger transportation in cities far and wide.

RUBBER CEMENTS. A composition consisting of rubber, linseed oil, and asbestos fiber for luting joints in stoneware, etc., is prepared by dissolving rubber in hot oil and adding asbestos to form a putty. Self-vulcanizing rubber cement painted or troweled in place resists both corrosion and abrasion.

[1] Research by C. F. Hirshfeld, chief engineer, Electric Railway Presidents' Conference Committee, Detroit, Mich.

EDITORIALS

Rubber Printing Plates

THE development of rubber plates for printing has been progressing slowly but surely in the past year. Now both the manufacturers of rubber plate gum and the printers who use the plates are just beginning to realize the great possibilities of rubber in the printing industry.

The basic advantages obtained by using rubber for printing plates are:

Effects great economy in cost by comparison with art and metal engraving cost.

Permits wider range for usage on many kinds of paper and cloth.

Saves time in makeready.

Gives a more natural and artistic reproduction.

Creates an enlarged market in printing by bringing to the door of the small business man the full use of color advertising economically.

The hand cutting method and the Bakelite-rubber molding process of plate making have both been previously described in this journal, and attracted wide attention. Now comes the introduction of rubber in fine printing such as book work, and the first book to be printed from rubber plates in this country was "The Emerald Murder Trap" by the Scribner Press of New York. This was the result of 2 years' experimenting and shows the progressive book manufacturer how to produce better books cheaper.

Business Is Better

THE reassuring developments in general trade throughout the United States during the past month have resulted in a brighter outlook for the business world. The following facts from The Cleveland Trust Co. bulletin are much to the point.

Uncertainties about the outcome of the elections have been replaced by uncertainties about the significance of their outcome. Business has no longer any doubt as to the attitude of the people toward the policies of the administration, but it is asking many anxious questions about the coming activities of the new Congress. Probably it is true that its anxieties do not in the main relate to fears that the new lawmakers will persist in enacting radical legislation. Business fears rather that the next Congress will devote its energies to the passing of huge appropriations designed to benefit constituencies, but designated as features of an emergency recovery program.

The developments of this year have clearly shown that a national policy of spending our way back to prosperity is far more effective in arousing popular enthusiasm than it is in producing sturdy business expansion. It has now become only too evident that the reabsorption of the unemployed workers by an expanding industry is going to be at best a long and slow process. Meanwhile large expenditures for relief will continue to be necessary, and our national resources will have to be husbanded to meet them. It is for these reasons that business has more acute fears that the new Congress will be prodigal than that it will be radical.

Business in October was better than that of September in just about the degree that it was benefited by the ending of the great textile strike. Ever since the middle of this year the volume of industrial production has been fluctuating about levels that maintained in the spring of 1933. They are above the level of April of that year and well below that of May. There has been very little net gain made and held by productive industry since the bank crisis.

Rubber Workers to Elect Representatives

A MOST important case was decided last month that will go far in straightening out the difficulties confronting the unions and rubber employes in complying with the rules of Section 7A of the National Recovery Act, relating to collective bargaining. Elections for employe representatives in the plants of the Firestone Tire & Rubber Co. and The B. F. Goodrich Co. were ordered November 21 by the National Labor Relations Board. The Board held hearings for the rubber cases 4 weeks ago on petitions of union employes. In each case elections were directed to be held within 3 weeks.

As the petitions only requested an election, the Board did not decide in these proceedings whether Section 7A had been violated. The elections will affect 9,000 Firestone employes and 12,000 Goodrich workers.

William Green, president of the American Federation of Labor, was said to be well pleased with the decision of the Board in the rubber cases and pledged the A.F.L. "to abide by the result of the election and be willing to be governed by the will of the majority."

"COMPOUNDING INGREDIENTS," A COMPREHENSIVE classification of rubber chemicals by functions, will be published serially in INDIA RUBBER WORLD beginning with the January 1, 1935, issue. Renew your subscription. You cannot afford to miss these important articles.

What the Rubber Chemists Are Doing

Technical Data on Latex[1]

THE term latex may be applied to all naturally occurring milk-like fluids of vegetable origin, but its use technically is becoming more and more restricted to those which contain rubber or rubber-like hydrocarbons. There are well over 200 different types of trees known to contain rubber or related hydrocarbons in their latices though only a few of them are of commercial importance; the only one requiring any mention here is *Hevea brasiliensis*.

Practically all the rubber latex of commerce is derived from *Hevea brasiliensis*, cultivated in the Middle East. As is well known, the latex is obtained by tapping the tree trunks, bulking the individual yields, and, when destined for oversea transportation, treating the latex with ammonia to preserve it and prevent coagulation in transit and subsequent storage.

Specific Gravity of Normal Latex

The specific gravity of latex varies with the rubber content, and the latter varies with the age of the trees, tapping conditions, weather, and other factors. It is far from being a constant quantity. However under well-supervised plantation conditions, latex, as collected for shipment to this country, usually has a specific gravity of 0.974 to 0.980. This corresponds approximately to a dry rubber content of 35 to 40%. One gallon (American) of such latex will weigh about 8.14 pounds and contain from 2.91 to 3.32 pounds of dry rubber. The following table gives the approximate relationship (calculated values) between specific gravity and rubber concentration.

Specific Gravity	Gms. Rubber per 100 CC.	Lbs. Rubber per Gallon	Lbs. Rubber per Lb. Latex
.9504	60	5.00	0.625
.9620	50	4.16	0.541
.9678	45	3.75	0.462
.9736	40	3.32	0.426
.9794	35	2.91	0.372
.9852	30	2.50	0.317
.9910	25	2.08	0.262
.9968	20	1.66	0.208
1.0003	17	1.41	0.1762
1.0026	15	1.25	0.1558
1.0084	10	0.83	0.1028
1.0142	5	0.41	0.0505
1.0200	0	0.00	0.0000

Size and Shape of Rubber Particles in Latex

As is well known, latex consists of a more or less concentrated suspension of dispersed rubber in an aqueous medium (serum). The rubber particles vary considerably in size and shape. The majority, however, are elongated and somewhat pear-shaped. The size of the globules of rubber are believed to be from less than 0.5 to 3 microns in diameter and 4 to 6 microns in length. The rubber particle consists, according to Hauser, of 3 distinct parts—an outer layer or film of adsorbed substances, presumably containing proteid substances; then a nearly solid elastic shell surrounding a viscous but rubber-like interior. The latter 2 constituents compose the actual rubber particles.

Electrical Properties of Latex

The particles of the rubber, or disperse phase, in latex carry a negative electric charge. The same is true for ammonia-preserved latex. If an electric current is passed through latex, the rubber particles migrate toward the anode or positive electrode where they become discharged and flocculate, forming a concentrated deposit. This is the basis of the Anode process of forming rubber articles from latex.

Surface Tension of Latex[2]

Normal latex has a surface tension of about 40.5 dynes per centimeter. Dilution diminishes the surface tension until a minimum value of 30.5 dynes is reached at a rubber concentration of 0.55%. Further dilution then causes the surface tension to increase and finally approach that of water, which is 71 to 72 dynes per centimeter at 30°C.

Hydrogen Ion Concentration of Latex

Determination of the pH value of latex offers difficulties on account of the sensitive colloid nature of the latex. Various figures have been published, such as 5.8-6.3 (Belgrave) and 6.2-7.0 (Bobilioff) depending on the method used. Hauser has found the value 7.0-7.2 for freshly tapped latex, using Wullf indicator paper. When this drops to 6.9-6.7 after standing a few hours, the latex coagulates.

For rapid but rough determinations of pH values in latex work, B.D.H. Universal indicator (British Drug Houses) may be used. This works over a range of pH 4 to pH 11. Ammonia-preserved latex containing 0.45% of anhydrous ammonia has a pH value of around 11. The pH value varies with the ammonia content.

Composition of Latex

Since the rubber content as well as that of other constituents of fresh latex is subject to considerable variation, it is impossible to give definite, standard figures covering the composition. The following figures[3] may, however, be regarded as approximately representative of average normal latex as collected.

	%
Rubber	37.13—41.29
Resins	2.03— 3.44
Albuminoids	2.18— 2.8
Sugars	0.36— 4.17
Mineral matter	0.4
Water	52.3 —55.1

Preservation of Latex

Freshly tapped latex does not keep beyond a few hours at ordinary temperatures. Bacterial action sets in, producing acidity and coagulation. In order to prevent spontaneous coagulation and render the latex stable for transportation overseas, a preservative must be added. Many substances act as latex preservatives, each one having its own particular drawbacks. Ammonia has the fewest or least troublesome objections; hence ammonia is the preservative almost universally used. The ordinary latex entering the United States at the present time is preserved by the addition of at least 0.5% of its weight of dry ammonia, which is passed into the latex as ammonia gas from cylinders. The presence of this ammonia must always be reckoned with in latex work. The ammonia content diminishes slowly; for instance, a latex containing 0.65% on the estate may show only 0.55% of ammonia when it reaches the United States.

Concentrated Latex

The idea of concentrating latex was born of the fact that ordinary latex contains 50% or more of useless water, the transportation charges on which are higher than those on the actual rubber. At present, however, the cost of concentration appears to be higher than the cost of transporting the water removed. At least the concentrated article sells at a premium over the normal product per pound of dry rubber. Nor is all the concentration being done in the producing countries.

There are 4 known methods of concentrating latex: namely, evaporation, centrifuging, creaming, and filtration.

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[1] Abstracted from *The Vanderbilt News*, Sept.-Oct., 1934, pp. 26-28.

[2] From "Chimie et Technologie du Latex de Caoutchouc," by Georges Génin, Paris, 1934, p. 43.

[3] *Ibid*, p. 45.

Only the first 3 methods are used on a large commercial scale, and each method produces a product of somewhat individual characteristics.

Evaporation

With suitably designed apparatus latex can be evaporated to commercial concentrations as high as 75%. The evaporated latices that have appeared on the market have usually contained the whole of the natural latex solids and in addition thereto, added protective colloids of a soapy nature. Such protectives are added to assist in the evaporation process and to prevent coagulation during evaporation and in the final product. Concentrated latex prepared by this method has largely been useful in the field of adhesives and in highly filled compounds. For many purposes the presence of the added soapy material has been a disadvantage; but where large proportions of fillers are present, the disadvantage is largely nullified, and the material has been quite satisfactory for such compounds and uses. Generally speaking, latex of this description has not been satisfactory, for instance, for pure rubber articles and for dipped goods. The average difference between the total solids of such latex and the actual dry rubber content is comparatively high, being about 7% and made up of natural non-rubber constituents and added non-rubber constituents. Generally such latex is extremely stable and this, of course, is an advantage or a disadvantage, depending on the use to which it is to be put. This latex is generally preserved with a fixed alkali, the effects of which must also be considered.

Creaming

Creamed latex is obtained by treating normal latex with organic materials, which causes it to separate into 2 fractions; the upper fraction being a concentrate of 50 to 60%, and the lower fraction containing very little rubber. The 2 fractions are separated by the simple process of decanting or drawing off the rubber-poor fraction. The concentrated latex obtained generally has left in it a portion of the organic creaming agent used. As such materials freely absorb moisture, their presence is, in some cases, a disadvantage. This latex has, however, found a wide use in the field of adhesives and for the manufacture of rubber articles. Generally it is preserved with ammonia and is available in a number of different concentrations and forms. Substances that may be used to effect the creaming of latex are Irish moss, gelatine, Karaya gum, ammonium alginate, and the like.

Centrifuging

Generally centrifuged latex has been quite acceptable to rubber manufacturers due to its comparative uniformity. Contrasted with evaporated latex or with creamed latex, a considerable part of the non-rubber constituents is removed during the process of centrifuging. In the commercial latex available these are not all removed but are partly removed, and as such latex in concentrations of up to 60% is stable enough for ordinary commercial uses, no added protectives or preservatives are required, and the material is adequately preserved with about 0.5% of ammonia. Particularly where this latex is obtained in a good white color, is free from precipitate, and bulked according to the quantities required, it has so far, apparently, provided the most uniform type of standardized, concentrated latex yet developed. In compounding with the usual vulcanizing ingredients and fillers, if additional stability is required, it is easily provided for during the compounding operation. This latex has been almost universally adopted for the production of dipped goods, proofings, and the like where, under careful control, it has given quite uniform results comparable to those that might be expected with the best grades of plantation.

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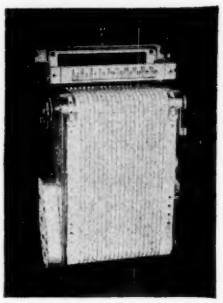
New Machines and Appliances



Esterline-Angus Recorder

Graphic Time Recorder

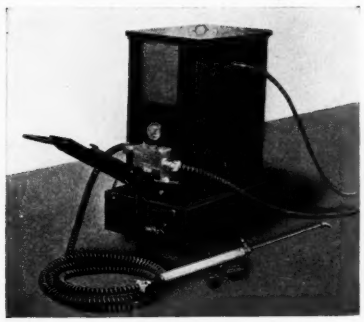
IN THE manufacture of molded rubber and Bakelite products the control of curing time is very important to maintain capacity output and uniformity of product. Automatic and semi-automatic molding equipment has increased rather than lessened the need of supervision. Speed in production has reduced costs, but the demand for uniformly high quality requires more rigid control of processes.

The instrument here shown is a graphic time recorder of a type that operates from 5 to 20 pens, recording accurately curing time, production of each mold, and the efficiency of the operator in charge. Installations of this recorder in large tire molding plants have caused a general increase of efficiency, promoted production through the elimination of avoidable idle time, and stimulated the pressmen to follow the time cycle closely, with a corresponding increase in uniformity of quality. The Esterline-Angus Co., Indianapolis, Ind.

Vapor Spray Cleaner

THE apparatus illustrated is a fireless high-pressure spray machine of simple compact design with the fewest possible parts and is easily moved about. The unit consists of a water or solution tank, containing an automatic float level valve. The rotary pump, directly connected to and driven by a fractional-horse-power motor, is operated from light socket. The amount of compound and moisture content can be varied at will by means of a manually adjustable mechanism, which enables the operator to obtain anything from a heavy cutting spray to a light cleaning mist. Full nozzle control is obtained by a valve on the gun, covering an operating range of pressure from 50 to 250 pounds.

The machine or "jenny" is designed for vapor spray cleaning in all plants where steam is available. It provides all the essential requisites for any cleaning job: namely, heat, water pressure, and cleaning compounds, automatically and uniformly combined in a single vapor spray emitted at high velocity from the nozzle, enabling the operator to get the maximum cleaning effect in one operation. Homestead Valve Mfg. Co., Coraopolis, Pa.



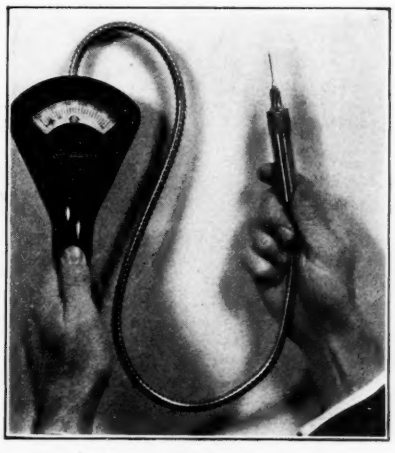
Homestead Vapor Spray Cleaner

Needle Pyrometer

THE needle pyrometer pictured is of the thermo-electric type. Its operation depends upon the principle that when 2 wires of dissimilar metals are joined together to form a closed circuit and one junction is heated, an electromotive force is set up, the amount of which is dependent upon the difference in the temperatures of the hot and cold junctions. The temperature of the cold junction being fixed, the temperature of the hot junction may be calculated by measuring the electromotive force on a millivoltmeter. The millivoltmeter is calibrated to read directly in degrees of temperature so that calculations are unnecessary.

The contact element of the pyrometer is a hollow needle of stainless steel, similar to a hypodermic needle. It contains a sensitive thermocouple connected through a length of flexible metal tubing to the under side of the metal case containing the millivoltmeter. The case is shaped to provide a convenient handle. The indicator has an easily read scale, 3 inches long, calibrated directly in degrees Fahrenheit, with a standard range from 50° to 400°.

This instrument will be found useful in laboratory and factory in determining and regulating suitable heats for plasticizing, milling, and calendering, especially of stocks sensitive to scorching. Cambridge Instrument Co., Inc., Grand Central Terminal, New York, N. Y.

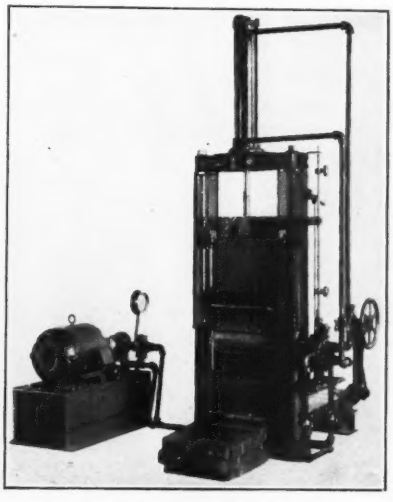


Cambridge Needle Pyrometer

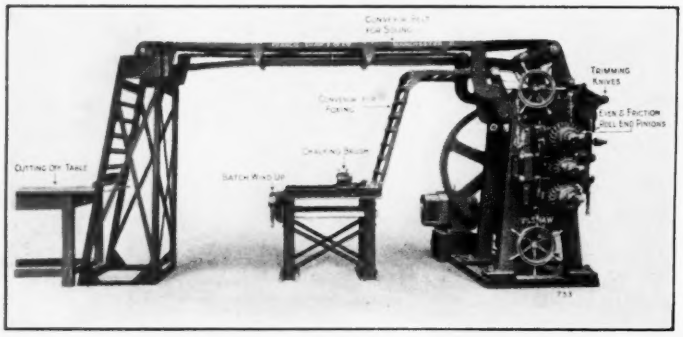
Crude Rubber Cutter

THE problem of slicing bales of crude rubber into pieces convenient for batch weighing and milling is solved most satisfactorily by the specially designed hydraulic cutter here pictured. It is a self-contained portable unit, simple in design, sturdy in construction, efficient, and fast working. The power unit accessory to the cutter comprises a 7½ h.p. motor driving a Vicker's pump mounted upon a 30-gallon tank containing oil for hydraulic operation of the cutter. The forward feeding mechanism is operated by means of the handwheel and advances the bale under the knife for the desired thickness of slicing.

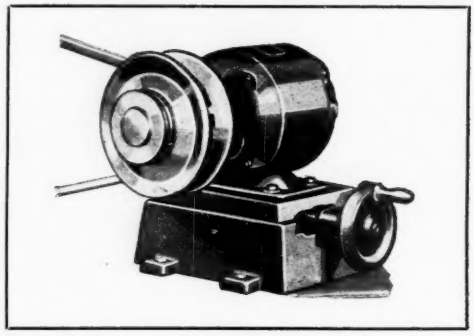
The handwheel and the knife operating lever are within easy reach of the operator. When the tripping lever is operated, the knife descends powerfully, makes the cut, and automatically returns to its starting position. The machine will make about 4 cuts per



Black Rock Crude Rubber Cutter



Shaw's Combination Soling and Sheeting Calender



W. H. S. Variable Speed Pulley

minute on large bales and more when the full stroke of the knife is not needed.

Being self-contained, the cutter can be located at the point most convenient for handling the sliced rubber as at the compounding room or mill room. The usual cutting interval is for 2-inch slices. At this setting the machine will cut a 225-pound bale of smoked sheet rubber in 4 minutes or a ton in 35 to 40 minutes. The machine may be attachable for operation to the factory hydraulic system. The Black Rock Mfg. Co., Bridgeport, Conn.

Trimming Machine

THE accompanying illustration represents the latest development of a machine constructed for the removal of inside and outside annular overflows from molded rubber goods when the 2 overflows are located in different planes. The 2 tables of the machine are independent and adjustable. One table may be adjusted for removal of a mold rind from the center and the other for removal of one from the top or bottom of the article. Also the tables may be adjusted to bring both into the same plane. The space between the tables is also adjustable. The rotary knives are of diameter to permit shearing inside rinds on curves of one-inch radius.

The machine is designed to trim the inside and outside of molded rubber articles of curved and circular forms. It can be used also to trim strips, blocks, mats, etc. T. W. Morris, 6312 Winthrop Ave., Chicago, Ill.

Combination Calender

THE calender pictured is designed for the dual purpose of manufacturing shoe soling and alternatively for shoe foxing. This machine has 4 rolls, 3 set vertically and one off-set in line with the top roll. This off-set roll is engraved with the soling pattern. For soling, the rubber passes through the 2 vertical nips and then through the horizontal nip between the top roll and the engraved breast roll, thence forward to the overhead cooling conveyer, which delivers it to the cutting off table where it is cut to lengths and placed on trucks or in books.

When the machine is used for the manufacture of sheeting, the engraved breast roll is removed, and a smooth roll fitted in its place. The rubber for sheeting then passes between the 2 vertical nips, through the horizontal nip, and is carried by a small conveyer underneath the soling conveyer to the chalking machine.

If the calender is also fitted with even and friction end pinions, having a change-over from even to friction speed by means of claw clutches, it may be used for frictioning the fabric parts of rubber shoes and will then answer for a small daily output of rubber shoes at relatively small initial capital expenditure. Francis Shaw & Co., Ltd., Corbett St., Manchester, 11, England.

Variable Speed Pulley

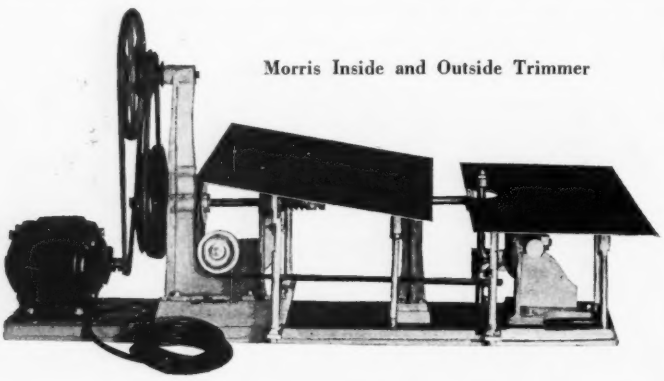
THIS variable speed pulley consists of 2 conical sections or 2 half pulleys. These have slots on their conical faces permitting them to interlock and giving a cog or positive drive effect to the variable speed pulley. Each half pulley is mounted on a bushing having a spiral key which engages with a spiral groove in the bore of the pulley. The bushing is keyed or setscrewed to the motor shaft.

As the base of the motor is moved back and forth, the 2 half pulleys will move together, or will separate, causing the belt to run on a small or large diameter of the pulley. The variation in speed is obtained by being able to drive from either the smallest or largest diameter of the pulley or from any diameter between the smallest and the largest. The center of the 2 half pulleys is always in line with the center of the driven pulley. Winfield H. Smith, Inc., Springville, N. Y.

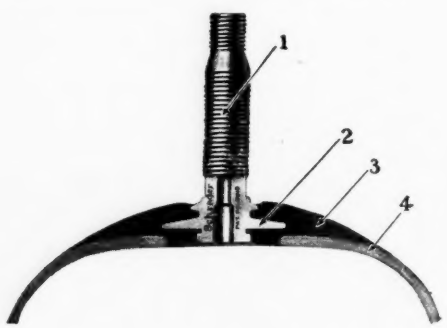
Rubber Covered Base Valve

A NEW type of tire valve has been developed for the automotive industry. As pictured in the illustration, its parts are 1, standard valve stem; 2, modified standard metal base; 3, rubber covered base cured on to metal stem base; 4, inner tube wall.

The large rubber base is molded to the metal stem and is cured to the inner tube, thus eliminating all joints around the valve base. The rubber base is securely attached and has the firm support of the inlaid metal reenforcement which is a part of the valve stem. This innovation retains all the advantages of the metal stem valve as well as the new features of rigidity, durability, appearance, and ease of mounting. A. Schrader's Son, Inc., 470 Vanderbilt Ave., Brooklyn, N. Y.



Morris Inside and Outside Trimmer



Schrader Rubber Covered Valve Base

Rubber Industry in America

OHIO

TIRE and other rubber goods production during November was only moderate in volume, following the usual seasonal trend. Uncertainties concerning the outcome of the labor situation complicate the outlook. Large volume production for 1935 by the automobile industry should soon enliven the output of tires, tubes, battery boxes, and rubber automotive sundries.

The recent increase in tire prices makes excellent the outlook for good business at a profit. Another encouraging factor in the tire industry is Henry Ford's announcement of a greater production schedule, which should bring $20,000,000 worth of tire business to Akron. The outlook for the golf ball thread industry also is very bright, and judging from orders already placed for next season's requirements, business should be very much better than during last season.

Goodyear Tire & Rubber Co., Akron, recently named N. L. Kuehn Co., Milwaukee, Wis., as a distributer of Goodyear mechanical rubber goods.

Export Expert

At the head of the export division of The General Tire & Rubber Co., Akron, O., is a man whose background, training, and experience well qualify him for so important a post, and his record may well be the envy of all other export men. Joseph A. A. Andreoli was born in Amsterdam, Holland, February 26, 1895, and attended the grade, high, and Handelschool (school of commerce) schools in his native city, graduating from the last in July, 1913.

Until 1918, Mr. Andreoli was, to use his own expression, "Jack of all trades." Then The B. F. Goodrich Co., Akron, hired him, first in the factory and then in the office. In 1920 he joined the Goodyear Tire & Rubber Co., Akron, as a staff member of its export company. In June, 1926, however, he signed with the India Tire & Rubber Co., Akron, as export manager, and during his 5 years there he developed the India export business from nil to 40% of the total factory output. In November, 1930, Mr. Andreoli became director of European sales in the General Tire export department. Under his capable guidance General tires now are available in every civilized country of the globe; the company has reduced foreign investments by 70% and increased volume 150%. At present Mr. Andreoli is vice president and general manager of the General Tire Export Co. He is also a director of the Rubber Export Association. His home address is 427 Hillwood Dr., Akron.

Joseph A. A. Andreoli

The B. F. Goodrich Co., Akron, has announced that N. A. Pierce has been appointed division operating manager with headquarters in Minneapolis, Minn. He joined Goodrich in 1929 as traveling auditor; then he was assigned to the Minneapolis district in 1933 and served in that capacity until his present appointment.

Walter H. Juve, president, Akron Golf Ball Thread, Inc., 124 Clemmer Ave., Akron, recently returned from a 5-week business trip to Norway, Germany, and England. His company, which is also sales agent for IVCO rubber lacquer, has its thread rubber factory at Bristol, R. I.

The Firestone Tire & Rubber Co., Akron, on November 12 started a series of nationwide broadcasts, the new "Voice of Firestone" program, featuring Richard Crooks, Gladys Swarthout, Nelson Eddy, the Rhythmic Chorus of 18 voices, and William Daly's orchestra. Firestone's assistant export manager, E. E. Pardee, recently returned from a 6-month business trip around the world. He found business conditions improved in most foreign countries.

Melflex Products Co., manufacturer of Melflex Safety Treads and Health Ropes, mats, runners, Electro Safety Pads, molded rubber goods, and Melastic cement, 158 N. Portage Path, Akron, has announced that several leading operators and manufacturers of buses and motor coaches have equipped their vehicles with Melflex non-slip safety treads, having found that they outwear metal ones.

The Aetna Rubber Co. has moved its executive offices to 815 E. 79th St., Cleveland.

The Goldlov Rubber Co., having leased the equipment of the former Floral City Rubber Co., S. Poplar St., Fostoria, has started production. The concern, which now manufactures a medium priced rubber glove for household or hospital use and expects later to produce heavier household and heavy electricians' gloves, has enough orders on hand to run 6 months. A considerable quantity is shipped to branches in Holland and Belgium. Additional equipment has been ordered, and as soon as possible 3, 8-hour shifts daily will be inaugurated. M. J. Goldstein and A. Loewenthal, both of New York, N. Y., head the concern. A. Spiro is superintendent and general manager.

Tire Prices Up

Within the past month leading tire manufacturers scrapped NRA "floor prices" and substituted their own plan of price control, calling for increases in prices of tires. The Goodyear Tire & Rubber Co., Akron, O., which started the move, raised prices 12 to 25%, "depending upon type, brand, and locally prevailing trade practices." The increase of The B. F. Goodrich Co., Akron, averages about 10%; while the United States Rubber Co., 1790 Broadway, New York, N. Y., announced an increase of 5 to 13.8% to the consumer. The General Tire & Rubber Co., Seiberling Rubber Co., and The Miller Rubber Co., all of Akron, plan increases of from 5 to 25%. The higher prices for The Firestone Tire & Rubber Co., Akron, are not yet on hand. Sears, Roebuck & Co., Chicago, Ill., raised prices 20%. It is reported, however, that tire manufacturers of Canada, including United States subsidiaries, will not raise tire prices in the Dominion.

The adjustments set list prices 5% higher than present list prices, but the increases actually are much larger since list prices were disregarded generally in the period of the "floor price" control. In some sections of the country, it was said, the increase will be as much as 75%, but the average will be only 18%.

Observers said the step brings about the biggest single price advance in many years. Those in the industry hail the move as the first return to profitable business since the beginning of the depression. Substantial increases in production costs during recent months made mandatory higher prices.

FINANCIAL

Company Reports

American Cyanamid Co., 30 Rockefeller Plaza, New York, N. Y., and subsidiaries. Nine months ended September 30: net income after depletion, depreciation, research and process development expenses, interest, income taxes, minority interest, and other charges, $1,573,988, equal to 62¢ a share on 2,520,373 $10 par shares of combined Class A and B common stock, excluding shares held by subsidiaries. This compared with $1,500,811 income, or 60¢ a share, on 2,470,123 shares last year. Quarter ended September 30: net income, based on reports for 6 and 9 months, $507,842, equal to 20¢ a share on 2,520,373 combined shares, compared with $977,544, or 39¢ a share, on 2,470,123 shares in the third quarter of 1933. Figures are subject to year-end adjustments.

Baldwin Rubber Co., Pontiac, Mich. Third quarter ended September 30: net loss after taxes and other charges, $8,942.96. Surplus September 30, 1934, $197,967.86.

Boston Woven Hose & Rubber Co., Cambridge, Mass. Corrected statement: year ended Aug. 31: net income after depreciation, taxes, expenses, and other deductions, $113,853, equal, after 6% preferred dividends, to 80¢ a share on 86,000 common shares, against $54,991, or 12¢ a common share, in the year ended Aug. 31, 1933.

Jenkins Brothers, 80 White St., New York, N. Y. Nine months ended September 30: net income, after expenses, depreciation, and other charges but before federal taxes, $178,798, equal, after 7% preferred dividends, to $1.17 a share on 125,744 combined common shares. Quarter ended September 30: net, before taxes, $68,539, or 46¢ a common share, compared with $60,241, or 39¢ a share in previous quarter, and $50,018, or 31¢ a share, in the first quarter of this year.

Monsanto Chemical Co., St. Louis, Mo. Profits during the third quarter were approximately $566,195, or 65½¢ per share on 864,000 shares outstanding, compared with $680,757, or 78½¢ per share (giving effect to the 2 for 1 split), for the corresponding quarter last year. Increased efficiencies were unable to offset higher labor and other costs and a smaller sales volume. For the 9 months earnings were approximately $1,945,230—$1,519,704 was earned during the corresponding period of 1933. Pro-rated, the 1934 earnings amounted to $2.25 per share, which compares favorably with $1.76 per share (giving effect to the 2 for 1 split), earned last year. All the foregoing figures are subject to independent audit. In view of this year's satisfactory earnings an extra dividend of 25¢ a share has been declared, which, together with the regular quarterly dividend of 25¢ a share, will be paid on December 15 to stockholders of record November 24.

New Jersey Zinc Co., 160 Front St., New York, N. Y. Nine months ended September 30: net profit after depreciation, depletion, contingencies, and other charges, $2,833,149, equal to $1.44 a share on 1,963,264 $25 par shares, against $2,885,290, or $1.47 a share, last year. Quarter ended September 30: net profit, $746,637, or 38¢ a share, compared with $994,304, or 51¢ a share, in the previous quarter and $1,514,909, or 77¢ a share, in the third quarter of 1933. The company states that earnings this year were in excess of those for the same period in 1933, but dividends from subsidiaries and non-recurring receipts were less.

Norwalk Tire & Rubber Co., Norwalk, Conn. Year ended September 30: net profit after depreciation, provision for doubtful accounts, federal excise taxes, and other charges, $11,324, equal to $1.23 a share on 9,184 $50 par shares of 7% preferred stock, compared with $73,556 in preceding year, equal after preferred dividend requirements to 20¢ a share on 197,705 no par common shares.

Raybestos-Manhattan, Inc., Bridgeport, Conn. Nine months ended September 30: net income, $892,838.55, equivalent to $1.39 per share, comparing with net income of $694,777.03, or $1.08 per share, during the same period in the year prior. The balance sheet at September 30, 1934, revealed total assets amounting to $16,451,829.98, including $7,948,806.90 of current assets, equivalent to 13 times the current liabilities of $599,291.35 at the close of the period. The company had no banking or funded debt or other capital obligations. The book value of its 642,900 shares of stock outstanding, after deducting the 33,112 shares held in the treasury, was $23.34 per share. The net current assets represented $11.43 per share, of which cash and marketable securities amounted to $4.52 per share.

The Thermoid Co., Trenton, N. J., and wholly owned subsidiaries, exclusive of Southern Asbestos Co., Charlotte, N. C.. Quarter ended September 30: net loss after interest, depreciation, and other charges, $78,305. Southern Asbestos Co., a 96% owned subsidiary, reported for the same quarter a net loss of $5,330 after depreciation and other charges.

New Incorporations

Amsul Corp., (N. Y.), 100 shares, no par value. E. E. Mitchell, 302 Broadway, New York, N. Y. Coffee, cocoa, and rubber.

Boston Belting & Rubber Corp., (N. Y.), 1,000 shares, no par value. I. B. Moore, 28 Appleton St., Watertown, K. W. P. Reece, 38 Thaxter St., Hingham, both in Mass., W. K. Shanning, 11 Fairfield Pl., E. J. Mogol, 1025 Montgomery St., both of Brooklyn, N. Y., and C. C. Cormany, 38 Oakridge Rd., Verona, N. J. Belting and rubber products.

Goldlov-Baron Rubber Corp., (N. Y.), $20,000. Weberman & Goldstein, 401 Broadway, New York, N. Y. Rubber materials.

Para Rubber Co. of N. Y., Inc., (N. Y.), Nov. 15, capital $20,000. M. Weil, 225 Broadway, New York, and H. Greenberg, 1574 President St., and S. Kirsch, 1649 E. 19th St., both of Brooklyn, all in N. Y. Rubber products.

Rubber Displays, (N. J.), capital $100,000, divided into 10,000 shares at $10 each. M. Carter, Ewing Township, Trenton, N. J., 4,800 shares; E. B. Carter, Lexington, Mass., 5,000 shares; and W. C. Wall, Ewing Township, Trenton, 25 shares. Offices located at 15 W. State St., Trenton, with W. E. Blackwell as agent in charge. Manufacture various kinds of rubber products.

Syndicate Export Corp., (N. Y.), Nov. 13, capital $10,000. L. Pieninger, R. Quintana, both of 500 5th Ave., and S. Jorgensen, 100 Broad St., all of New York, N. Y. Rubber goods.

United Carbon Co., Charleston, W. Va., and subsidiaries. First 9 months of 1934: net profit, $988,413 after depreciation, depletion, federal taxes, and other charges. This is equivalent, after dividends paid on the 7% preferred stock called for retirement on July 1 last, to $2.53 a share on 370,127 no-par common shares. In the first 9 months of 1933 the company earned $479,647, or $1.05 a common share. Quarter ended with September indicated net profit, $318,040, equal to 86¢ a common share, compared with $360,510, or 90¢ a share, in the preceding quarter, and $178,916, or 40¢ a share, in the third quarter of 1933.

Dividends Declared

Company	Stock	Rate	Payable	Stock of Record
Boston Woven Hose & Rubber Co.	6% Pfd.	$3.00 s. a.	Dec. 15	Dec. 1
Firestone Tire & Rubber Co.	6% Pfd.	$1.50 q.	Dec. 1	Nov. 15
Gates Rubber Co.	Pfd.	$1.75 q.	Dec. 1	Nov. 15
Goodyear Tire & Rubber Co.	7% Pfd.	$1.00 q.	Jan. 2	Dec. 1
Hope Webbing Co.	Com.	$2.00 q.	Nov. 1	Oct. 26
Plymouth Rubber Co., Inc.	7% Pfd.	$1.75 q.	Oct. 15	Oct. 1
Raybestos-Manhattan, Inc.	Com.	$0.25 q.	Dec. 15	Nov. 30

NEW ENGLAND

RUBBER goods production in the New England area is improving seasonally, at least. Footwear lines for winter use are keeping the shoe plants busy on full-time of 5 days a week. Production of code wire and lamp cord is getting better. The outlook for 1935 is good also for heels, soles, sponge rubber products, rubber specialties, mechanicals, and battery boxes. For inventories of customers are running low, so will need to be replenished. Equipment manufacturers, however, are still suffering, but much new machinery is needed for replacements and to offset higher labor costs.

From one source comes the report that it is very apparent that the footwear division of the rubber manufacturing industry has much to do along constructive lines from a merchandising standpoint before it can operate profitably. Unit production for the first 9 months of 1934 shows a substantial increase, but unless abnormal winter conditions develop, prevailing list prices as a whole are not favorable.

The Donovan Rubber Co., a new enterprise at 146 Commercial St., Lynn, Mass., gets out rubber heels and plans to make rubber soles also. Harry J. Donovan, formerly in the leather business, is selling the rubber products to the New England trade.

Spraco, Inc., engineer-manufacturer, 114 Central St., Somerville, Mass., has changed its name to Spray Engineering Co.

U. S. Rubber Products, Inc., Naugatuck, Conn., because of an improved inventory position for 2 weeks beginning November 19, was able in the waterproof factory to operate 5 additional making conveyers. About 200 workers were reemployed for the fortnight.

E. H. Clapp Rubber Co. properties in Hanover and Pembroke, both in Mass., will be sold at public auction December 13. The business, founded about 50 years ago by the late E. H. Clapp, was the first factory to reprocess old rubber. When the price of crude rubber was so high, the plant prospered and was a steady factor in the industrial life of the section where it is located.

Franklin R. Hoadley, vice president of Farrel-Birmingham Co., Inc., Ansonia, Conn., and chairman of the code authority of the Gray Iron Foundry Industry, delivered before the Providence Section of the American Society of Mechanical Engineers on November 9 an address on "Problems Confronting the Durable Goods Industries." He outlined the factors influencing recovery. In conclusion Mr. Hoadley urged the adoption of "constructive policies which will assure prosperity; assurance to private enterprise that the profit incentive will continue to receive public approval as an energizing motive for economic activity; public recognition that the only legitimate purpose of taxation is to provide the necessary revenue for government . . . ; early reassurance of a balanced budget and removal of the threat of uncontrolled inflation or of any sudden and arbitrary change in our monetary policies . . . . With these assurances we shall have necessary relief and adequate reforms, but what is vastly more important, by the release of natural forces we shall have reemployment and recovery."

Omo Mfg. Co., 50 Walnut St., Middletown, Conn., has been taken over by the controlling interests of the Columbia Cement Co., 150 Ingraham St., and Columbia Combining Co., Inc., 360 Furman St., both of Brooklyn, N. Y. The new Omo executive personnel includes: president, James J. Colt; vice president, Herman Epstein; secretary, Martin Schnur; directorate, the company officers, Graham Seddon, and Frederick B. Fountain, the only member of the original group of Omo stockholders to retain holdings in the company. The Walnut St. plant is being enlarged, and additional machinery will be installed. The number of employes also will be increased. Besides the company plans later to erect a plant for the manufacture of rubber cement. Under the new management the Omo company will make not only dress shields, baby pants, and rubber capes and coats, but also shoe fabric, raincoat cloth, hospital sheeting, corset fabrics, rubber cement, gum rubber specialties, and custom rubberizing.

The Rhode Island Rubber Club Executive Committee has set January 9, 1935, as the date for the next meeting of the club in Providence, R. I. An interesting and enjoyable occasion is being planned, the program of which will be announced in forthcoming notices.

The Fisk Rubber Corp., Chicopee Falls, Mass., contrary to the normal trend this time of the year, has increased production considerably since November 1 and had hired several hundred more employes, making the total about 1,500. The cause of this increased activity is said to be the receipt of substantial orders for truck tires from a Scandinavian country. Fisk is also negotiating for a large order from a mail order house. Factory employes are on a 30-hour week, operating 2½ shifts a day. The recent rise in tire prices is expected to strengthen Fisk's position. The firm recently completed 18 months of business since its reorganization.

PACIFIC COAST

THE rubber situation on the Pacific Coast is looking up, and schedules are a little larger for the balance of the year. With another advance in tire prices in the offing business will become more stimulated. In the mechanical goods field business has increased in the last few months, and general conditions look much better. The retread tire business, however, has fallen off lately because of the low prices of tires, but with the price increase this trade should pick up in the spring.

Cyrus Field Willard, inventor of heat-resisting aluminum paints and the process of devulcanizing rubber by which the combined sulphur is removed and the rubber restored to approximately its original condition, has regained control of the Willard Rubber Co., 2320 Newton St., San Diego, Calif., as the result of a court decision recently handed down.

Recently the A. J. Donahue Corp., manufacturer of novelties and elastic products, called a recess at its factory in Milford, Conn., so that a photographic record could be made of the workers responsible for the output of the organization's production. The above is the result. President A. J. Donahue is seated second from the right.

OBITUARY

Goodrich Executive

FOLLOWING a long illness Harry D. Martin, assistant to the manager of automobile tire sales, The B. F. Goodrich Co., Akron, O., died on November 11 at his home in Silver Lake. Mr. Martin, who was born in Reading, Pa., 51 years ago, had been with the rubber company 17 years. Prior to that time he had worked for the Second National Bank, Reading, and then for the American Iron & Steel Mfg. Co., Lebanon, Pa.

He belonged to the Masons.

Surviving are his widow, a son, and 2 daughters.

The funeral was held November 14. Interment took place in Reading.

Financier

JACOB G. FEIST, who died November 15, at his home in Pottstown, Pa., in his fifty-sixth year, was a well-known financier and business man. He was born in Jersey City, N. J., and had only a limited education, but soon developed a talent for business promotion. He was connected with the financing of a nursery at Rochester, N. Y., and also the Proctor Slate and the Peach Bottom Slate companies in Harrisburg. His contact with the rubber industry was in a financial capacity with the Hydro-United Tire Corp., Pottstown.

Mishawaka Employe

A COMPLICATION of diseases, resulting in a 7-weeks' illness, caused the death on November 10 of John Charles Service, for 35 years connected with the Mishawaka Rubber & Woolen Mfg. Co., Mishawaka, Ind., in the payroll and credit departments. Mr. Service, born Jan. 21, 1859, in New Carlisle, Ind., had been a banker there before joining the rubber concern.

His widow, 3 sons, and a daughter survive him.

Crude Rubber Broker

WITH deepest regret we record the passing of Ernest Jacoby, dealer since 1911 in crude rubber, gums, liquid latex, carbon black, and clay, 79 Milk St., Boston, Mass. The end came on October 22 after a 12-day illness at his home in Brookline, Mass.

Mr. Jacoby was born November 6, 1880, at Manchester, England. He attended the local grade school and Hereford County College. Then from 1896 to 1900 he was employed by a commission house in Manchester. After arriving in the United States he became a salesman for Otto Meyer in Boston until 1904. Until 1909 he was the New England representative for A. T. Morse & Co., Boston. Then until he founded the company bearing his name, he acted as New England representative of the U. S. Rubber Reclaiming Works.

Ernest Jacoby

Among the clubs to which the deceased belonged were Exchange, Boston City, Cohasset Golf, Cohasset Yacht, Boston Chamber of Commerce, and Masons. All his interests, except the Jacoby Club of Boston, which he founded in 1909 to bring back to usefulness men who through intemperance or drug habits or who through misfortune had become discouraged, had been dropped in recent years because of failing health.

His widow, 2 sons, and a daughter, besides several brothers and sisters abroad, survive Mr. Jacoby.

His funeral was held from his home, and burial was at Walnut Hills Cemetery, Brookline.

Credit Man

AN AUTOMOBILE accident caused the death on October 26 in Scranton, Pa., of Donald S. Wright, 34, assistant credit manager for the eastern zone of the Firestone Tire & Rubber Co., Akron, O. He had joined the company in July, 1925, as a stock clerk in the Newark District office, becoming credit manager of the Richmond District in February, 1929. After having held similar posts at Washington and Harrisburg, he came to Akron in September, 1933, as assistant zone credit manager.

He is survived by his wife and a son.

Funeral services and burial were in Birmingham, Ala.

Firestone Engineer

AFTER an operation in Cleveland, O., Max H. Pade, head of industrial engineering, Firestone Tire & Rubber Co., Akron, O., passed away on October 6. With Firestone since 1918, Mr. Pade directed many important plans and installations not only at

(Continued on page 66)

NEW JERSEY

RUBBER manufacturers throughout New Jersey report rising business, and the majority of them are optimistic over the future. Production has increased for nearly all soft and hard rubber goods, but manufacturers claim prices of some products remain too low for any fair profit. Golf ball makers find 1934 trade very much better than 1933 business, with prospects bright for 1935. One manufacturer of rubber specialties, who is quite busy with rush orders, thinks conditions good for advancing markets. He further declares the Code has worked well so far and believes a serious situation would arise should the Code be eliminated. Tire dealers of the State have been notified by the Code director that floor level prices, as fixed by NRA order, are still the current prices in New Jersey.

Pequanoc Rubber Co., Butler, manufacturer of Aurora, Peerless, Paragon, Imperial, Neutrex, Ruby, Alba, and Gem brands of reclaimed rubber, lists the following representatives: Robert Knoblock, 2301 Lincoln Way West, Mishawaka, Ind.; Harold P. Fuller, 844 Park Sq. Bldg., Boston, Mass.; E. B. Ross, One Toronto St., Toronto, Ont., Canada; and Hecht, Levis & Kahn, Ltd., 17 St. Dunstan's Hill, E.C.3, London, England.

Minor Rubber Co., 216 Market St., Newark, which specializes in waterproof garments, reports that its business in fishing tackle has been unusually good.

Lambertville Rubber Co., Lambertville, was one of the heavy sufferers in the cyclone that swept the city on November 7. Part of the plant collapsed, in which many workers were injured, with some deaths resulting.

The Thermoid Co., Trenton, having completed its new power house and other improvements, now can handle a greater volume of business.

The Pocono Co., Trenton, continues with a full force. Company officials say they have many orders to be filled for the early winter trade.

Thiokol Corp., Yardville, is manufacturing a number of new products, for which the demand is good.

The American Hard Rubber Co., Butler, now operates under a newly signed employer-employe agreement that increases the hourly wage scales and improves working conditions. The agreement, which also applies to the company's plant at Akron, O., provides for union recognition for the first time in the company's history, but does not call for a closed shop. The Butler plant employs 800 workers; the Akron factory, 400.

Acme Rubber Mfg. Co., Trenton, reports that business, showing an upward trend, is much better than at this time last year. The concern is running normally.

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EASTERN AND SOUTHERN

MANUFACTURERS of mechanical goods in the East consider the outlook for winter business very good, and sales so far this year are much better than during 1933. The South, though, is not so optimistic. Competition has been a bit more severe than usual owing, it seems, to the way the policy of "open filing" has worked. It is believed that prices will gradually stabilize at somewhat higher levels that will permit a well-managed factory to avoid loss or to earn a little profit and that the volume which any individual factory will show will depend upon the intelligence and energy displayed by the management in merchandising its goods.

The shoe business in New York has dropped since July; and while the decline seems at its lowest ebb, there is definitely nothing in the near future to give any encouragement for better business. One of the main reasons for this condition is that last spring, when it was assumed the shoe industries might go on a 35-hour week, the larger shoe buyers placed advance orders, making possible manufacturers producing fall and winter shoes during the last spring. This state of affairs led to thousands of dozens of pairs of shoes being held in warehouses which normally would have been made this fall. It is now assumed that the shoe business generally would not be more than 75% of normal, and this figure would be reflected directly into the manufacture of rubber heels and soles. No upturn in the shoe manufacturing industry is expected until early spring.

Revertex Corp. of America, 40 Rector St., New York, N. Y., has announced the addition to its personnel of a new technical adviser, Dr. K. H. Quasebarth, who recently made extensive studies in Europe on the newest developments on the application of Revertex, a highly concentrated rubber latex.

Wishnick-Tumpeer, Inc., 251 Front St., New York, N. Y., has signed Dr. G. M. Mortati, for many years vice president of the Superfos Co., as manager of the Witco foreign department.

Southern Alkali Corp., Corpus Christi, Tex., was officially opened with a 2-day program beginning October 26. Among the prominent guests of this gala affair, numbering many men well known in the public and the business life of Texas and the Southwest, were officials of the American Cyanamid Co., 30 Rockefeller Plaza, New York, N. Y., and of the Pittsburgh Plate Glass Co., Pittsburgh, Pa., joint owners of the new enterprise. Harry L. Derby, vice president of Southern Alkali and of American Cyanamid, was one of the speakers at the well-attended banquet included on the program, which was arranged by local committees headed by the Chamber of Commerce of Corpus Christi.

Prof. E. A. Hauser

Professor Hauser to Visit America

American rubber chemists will soon have the pleasure of greeting Prof. Ernst A. Hauser, noted colloidal chemist and physicist, who sails from Europe on the *S. S. Majestic,* December 5, and expects to be in America about 2 months before continuing his journey to Japan and the Straits Settlements. While here he will visit various rubber concerns and people interested in crude rubber not only in New York and New England, but also in Akron, Chicago, and other rubber manufacturing centers.

Dr. Hauser is chief chemist of the Semperit Austro-American Rubber Works, Vienna, Austria. As a research scientist he is famed for his work on latex, which includes the structure of rubber particles, his theory of the elastic function of rubber, and his invention of the first commercially available concentrated latex. His scientific treatise "Latex" is a highly esteemed contribution to the knowledge of the complex problems of rubber technology.

Dr. Hauser will talk before the New York Group, Rubber Division, A. C. S., on December 14, on the latest developments in the use of rubber latex.

A.S.T.M. Committee D-13

The series of meetings of Committee D-13 on Textile Materials held in New York, N. Y., October 17, 18, and 19 were among the most successful yet held by this group. The meeting also celebrated the twentieth anniversary of the organization of the committee. A number of constructive actions were taken at the meeting, some of which are indicated in the following paragraphs.

The scope of Section V on Hose, Belt, and Numbered Duck of Subcommittee A-1 on Cotton and Its Products has been changed to cover all heavy cotton woven fabrics.

Revisions were recommended in the Standard Specifications for Textile Testing Machines. The changes provide for recognition of the constant specimen-rate-of-load machine as an approved type of tensile testing machine; the addition of a tolerance for testing machine speed; omission of reference to alinement pins; prevention of back-lash in dial pointer; and individual strand jaws. In the General Methods of Testing Woven Textile Fabrics a change will be balloted upon by the committee involving a method of determining elongation for which an initial load of 6 ounces is specified; while other loads may be specified for particular materials.

Following are the officers of Committee D-13: chairman, H. J. Ball, professor of textile engineering, Lowell Textile Institute, Lowell, Mass.; secretary, W. H. Whitcomb, 41 Norman Ave., Cranston, R. I.

The National Exposition of Power & Mechanical Engineering, a biennial event, is scheduled for the Grand Central Palace, New York, N. Y., December 3 to 8.

Edwin J. Hughes, Jr., Inc., selling agency for several firms including Stowe-Woodward, Inc., Newton Upper Falls, Mass., and Atlantic Products Corp., Trenton, N. J., has moved from the Empire State Bldg. back to the former address at 1270 Broadway, New York, N. Y., because of its more advantageous location to the trade.

Fenner & Beane, member of the Commodity and other leading exchanges, 67 Broad St., New York, N. Y., announced that on November 1, George Harrison Phelps, advertising and public relations counselor, became a general partner in the firm. His headquarters are at Miami Beach, Fla.

R. O. Bishop, of the Rubber Research Institute of Malaya, is in this country again on a short visit. Mr. Bishop, who will sail for London on December 10, may be reached while here at the Chemists Club, 52 E. 41st St., New York, N. Y. On December 7 he will address the Akron Group, Rubber Division, A. C. S., on latex.

The American Society of Mechanical Engineers will hold its annual meeting in New York, N. Y., December 3 to 8.

The John J. Gibbons Co., 292 Colvin Ave., Buffalo, N. Y., was chosen to represent the athletic products of Johnson & Johnson, New Brunswick, N. J., in the state of New York except for Westchester Co. and the metropolitan area, according to J. W. Luther, director of the athletic division of the Johnson company. Among other concerns for which the Gibbons firm is representative is The Worthington Ball Co., golf ball manufacturer, Elyria, O.

Robert Badenhop

Badenhop Anniversary

To commemorate the twenty-fifth anniversary of the establishment of their president, Robert Badenhop, in the crude rubber business the officers and employes of the Robert Badenhop Corp., Woolworth Bldg., New York, N. Y., gave a delightful buffet supper party at the Postheller, Woolworth Bldg., 5.30 p.m. November 23, 1934. Approximately 125 guests enjoyed the entertainment and congratulatory festivities.

Mr. Badenhop had many years' experience in the crude rubber markets of London and Hamburg, which served as a valuable background for establishing himself in the importation business in New York. During the 25 years of business here Mr. Badenhop has been very active in the administrative affairs of the Rubber Exchange of New York, now part of the Commodity Exchange, Inc., the Rubber Exchange Clearing House, Inc., and the Rubber Trade Association of New York, Inc.

The New York Automobile Show will be held at the Grand Central Palace, New York, N. Y., January 5 to 12, 1935.

J. E. Searle, elected a director of the Kelly-Springfield Tire Co., 405 Lexington Ave., New York, N. Y., in May, has resigned.

W. L. Finger has been appointed assistant to the general manager of The Rubber Manufacturers Association, Inc., 444 Madison Ave., New York, N. Y. Kenneth Andersen is secretary of the Auto Fabrics Division.

The Toy Manufacturers' Association has announced that the 1935 Toy Fair will take place at the Hotel McAlpin, New York, N. Y., April 1 to 20.

Vulcanized Rubber Co., Morrisville, Pa., operating to capacity on seasonable orders, expects to remain busy during the early winter. Many small improvements recently were made in the different mechanical departments.

Oscar Nelson Gives Week-End Party

Business and civic leaders, financiers, and technologists interested in the rubber, ink, and paint industries arrived in Charleston, W. Va., October 26 and 27, from all sections of the United States and Canada to participate in a festive annual week-end laboratory party as guests of Oscar Nelson, president of the United Carbon Co. More than 300 attended, including about 30 ladies, whom Mrs. Nelson entertained.

The guests from Canada, New England, and the New York region assembled in New York Friday as guests of Wm. W. Higgins, eastern district sales manager. A trip to the Empire State Building Tower, luncheon at the Empire State Club, and a cocktail party gave an enjoyable and fitting prelude to the overnight trip to Charleston in the Pullman cars and diner exclusively provided.

An inspection tour of the United Carbon Co.'s Research and Control Laboratory and also its Industrial Development Laboratory was conducted Saturday morning. Luncheon was served for the ladies and men at the Kanawha and Daniel Boone hotels respectively. In the afternoon all guests attended the spectacular football game between Charleston High and Ashland, Ky., High School. These schools are traditional rivals, and both were champions last year of their respective states.

Separate banquets were given for men and women in the evening, followed by a dance for both at the Shrine Mosque Ballroom.

G. A. Williamson, United Carbon vice president, served as toastmaster at the men's banquet. Mayor De Van and former Governor W. G. Conley welcomed the guests to Charleston. Rev. Harold Rose, of New York, N. Y., responded. Other speakers were French Robinson, manager of the Lycoming Gas Co.; W. B. Clarke, Monroe, La.; A. G. Treadgold, director and sales manager, United Carbon Co.; Thomas W. Bowers, vice president of the Bank of Manhattan; and R. P. Dinsmore, director of development, Goodyear Tire & Rubber Co., Akron, O., who spoke concerning the effect of federal economic policies on business.

Open house was held at Mr. Nelson's home for those remaining in Charleston, Sunday, and a ladies' night dinner was given that evening at the Kanawha Hotel for remaining ladies and their husbands.

Mr. Nelson considers this event as a symposium that aids members of the United Carbon Co. to address their progressive effort directly to the current problems of the various industries represented.

Northeastern Latex Co., 3 E. 17th St., New York, N. Y., handles sanitary rubber goods, nipples, and rubber sheets. A. Marans is sole owner of this company and of Marans Co., of the same address.

Oscar Nelson

Rubber Code News

Official Orders of NRA

Code No. 156: Order 40, denying application of the Stedfast Rubber Mfg. Co., Inc., North Easton, Mass., for exemption from the provisions of Chapter I, Article V-A, Section 1, of the Code.

Code No. 156: Order 41, denying application of the Marengo Garment Co., Marengo, Ill., for exemption from the provisions of Chapter X, Article III-B, Section 1, of the Code.

"Thin-Gaged" Raincapes

Raincapes of "thin-gaged processed rubber" are to be manufactured under the provisions of the sanitary and waterproof specialties manufacturing code, the National Industrial Recovery Board announced November 12. The question was raised after the rubber manufacturing industry's rainwear division held that the manufacture of such raincapes should be under its code.

Jar Rings Guaranty Clause

A public hearing will be held December 6 in the Department of Commerce Building, Washington, D. C., to give members of the jar rings subdivision of the rubber manufacturing industry an opportunity to present evidence for or against the warranty or guaranty provision of their code. Assistant Deputy Administrator J. H. Lonaerts will be in charge. The jar rings subdivision was granted a 60-day stay of the standard guaranty or warranty provisions on November 7, on the condition that a public hearing be held during the 60 days "to give the members of the subdivision an opportunity to present facts through the Mechanical Rubber Goods Divisional Authority to justify the provisions."

Rubberized Suedine Jackets

Manufacture of rubberized suedine jackets and other similar garments made of materials defined in the rubber industry's code is properly classified un-

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MIDWEST

RUBBER specialties manufacturers in the Midwest, enjoying good seasonal business, look forward to a much better season as the winter progresses. It is held, though, that if the larger corporations would get together and stabilize prices to the point where the smaller manufacturers would, at least, have a chance to meet competition in a way that would be more essentially competitive, this arrangement would greatly benefit the rubber sole and heel industry. The working of the Code, it is said, does not seem to benefit the smaller companies.

National Safety Council, 20 N. Wacker Dr., Chicago, Ill., lists the following officials of the Rubber Section elected at the last annual meeting: General Chairman: H. A. Walker, The Goodyear Tire & Rubber Co., Akron, O. Vice Chairman in Charge of Program: A. M. Dietz, Pennsylvania Rubber Co., Jeannette, Pa. Secretary: J. M. Kerrigan, U. S. Rubber Reclaiming Co., Inc., Buffalo, N. Y. News Letter Editor: W. H. MacKay, Dunlop Tire & Rubber Corp., Buffalo. Engineering Committee Chairman: D. G. Welch, Hewitt Rubber Corp., Buffalo. Health Committee: Drs. W. S. Ash, United States Tire Co., Inc., Detroit, Mich., and J. Newton Shirley, Arrow Mutual Liability Insurance Co., Watertown, Mass. Membership Committee Chairman: E. W. Beck, United States Rubber Products, Inc., New York, N. Y. Poster Committee Chairman: Oliver Hopkins, United States Rubber Products, Inc., Providence, R. I. Publicity Committee Chairman: John J. Loge, The General Tire & Rubber Co., Akron. Statistics Committee Chairman: Paul Van Cleef, Van Cleef Brothers, Chicago, Ill. Slides and Safety Kinks Committee Chairman: R. W. Morse, The Firestone Tire & Rubber Co., Akron. Members at Large: F. C. Bishop, The Richardson Co., New Brunswick, N. J.; J. C. Brown, The Gates Rubber Co., Denver, Colo.; R. A. Bullock, Corduroy Rubber Co., Grand Rapids, Mich.; John L. Grider, American Hard Rubber Co., Butler, N. J.; M. L. Russel, E. M. Smith Co., Los Angeles, Calif.

Link-Belt Co., 910 S. Michigan Ave., Chicago, Ill., has purchased the physical assets of the Bailey-Burruss Mfg. Co., 1116 Murphy Ave., Atlanta, Ga., and all divisions of the Link-Belt's Atlanta sales office are being moved to the Bailey-Burruss plant, which will henceforth be known as the Atlanta Plant of Link-Belt Co. The new combined operations will be headed by I. H. Barbee, transferred from the company's Philadelphia plant. Modern Coal Burner Co., a subsidiary of Peabody Coal Co. has relinquished its automatic stoker business, and Link-Belt has acquired manufacturing and sales rights to the Modern Coal Burner. Stocks of parts have already been taken over by the Link-Belt Stoker Division, the company's Caldwell-Moore plant at 2410 W. 18th St., Chicago.

The Society of Automotive Engineers will hold its annual meeting in Detroit, Mich., January 14 to 18, 1935. The Tractor & Industrial Power Equipment meeting is scheduled for Chicago, Ill., December 5 and 6, 1934.

L. P. Fischer, sales promotional representative of the Bowes Seal Fast Corp., Indianapolis, Ind., is in London, England. This is his first stop in a 1½-year around-the-world itinerary in the interest of the Bowes Seal Fast Corp.'s foreign affairs.

Baldwin Rubber Co., Pontiac, Mich., in announcing that the resolution adopted by stockholders last year, which provides for an exchange of stock, has been ratified by the exchange of approximately 90% of the stock outstanding at that time, asks that stockholders who have not yet made the exchange do so before their next annual meeting.

The National Sporting Goods Distributors' Association will hold its 1935 National Sporting Goods Show at the Hotel Sherman, Chicago, Ill., January 28, 29, and 30. Among the scheduled exhibitors are Athletic Shoe Co., Bennett Landon Web Co., Bike Web Mfg. Co., Brooks Shoe Mfg. Co., Burke Golf Co., Converse Rubber Co., Draper-Maynard Co., Golf Ball, Inc., Rawlings Mfg. Co., A. G. Spalding & Bros., Servus Rubber Co., Wilson-Western Sporting Goods Co., The Worthington Ball Co., and L. A. Young Golf Co.

A. C. S. Rubber Division Meetings

Akron Group

THE Akron Group, Rubber Division, American Chemical Society, will hold its next meeting December 7 at the Akron City Club. R. O. Bishop, of the Rubber Research Institute of Malaya, who will be in the United States from November 24 to December 10, will discuss "Recent Developments on Latex Production;" and W. B. Wiegand, director of research, Binney & Smith Co., 41 E. 42nd St., New York, N. Y., will speak on his recent trip to the Far East.

An innovation for the social period preceding the dinner will be a Free Oyster Bar set up in the Grill Room of the club. The dinner is scheduled for 6:30, to be followed by the program outlined above.

Los Angeles Group

THE Los Angeles Group, Rubber Division, A. C. S., will meet on December 13 in regular annual session to elect officers for the coming year. A paper on "Reclaims" will be presented by G. W. Miller, of the technical staff of the Xylos Rubber Co. This topic is of much present interest because of the higher price level of crude rubber.

After the holidays the regular mid-winter golf tournament will be held, probably the second Saturday in January.

New York Group

THE New York Group, Rubber Division, A. C. S., will hold its next meeting, dedicated to the annual Christmas party and dinner, on December 14 at the Building Trade Employers' Association club rooms, 2 Park Ave., New York, N. Y. (Tickets cost $2 per person.) Speakers for the evening include the well-known European chemist and rubber technologist, Prof. Ernst A. Hauser, who will discuss "Late Developments in the Use of Rubber Latex;" and Hugh Herndon, companion of Clyde Pangborn in their epic making flight around the world a few years ago, who, now with the Cities Service Co., will talk about "Aviation—Its Part in Industry." A program of entertainment up to the usual standard also is promised.

Chicago Group

THE first annual Christmas dinner party of the Chicago Group, Rubber Division, A. C. S., will be held in Hotel Sherman, Chicago, Ill., the evening of December 14. The affair is planned as a mammoth surprise event. Naturally complete details of the program have not been divulged, but the program as announced includes dinner at the College Inn of the hotel where the entire stage show and orchestra has been reserved for the occasion. The preliminary entertainment will be furnished by Ethel Shutta and her husband, George Olson. The speaker of the evening is William B. Wiegand, of Binney & Smith Co., 41 E. 42nd St., New York, N. Y., whose subject will be "Rubber Industry of Japan and China." This talk will be a rare treat.

All members of the rubber industry of the Midwest are invited to this gala occasion. Reservations may be made by addressing Dr. C. E. Frick, in care of Van Cleef Brothers, 7700 S. Woodlawn Ave., Chicago, or the secretary, B. W. Lewis, in care of Wishnick-

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Editor's Book Table

BOOK REVIEWS

"Rubber: Its Antioxidants and Preservatives." A bibliography compiled by the Science Library and the Research Association of British Rubber Manufacturers, London, England. 1934. Science Library Bibliographical Series No. 151. Board covers, 8 by 13 inches, 82 pages, plus supplement and list of journals on rubber chemistry. Price 5s. 0d. net.

The scope of the work comprises the theory of antioxidants, storage of rubber, corrosion and deterioration, absorption of water and other liquids, action of light, preservation in general, oil-, acid-, and liquid-resistant rubber, and antioxidants. The volume includes some 1,500 references. It is classified by the universal decimal classification, the numbers used being controlled by preliminary classification of the entries at the Research Association of British Rubber Manufacturers.

The work forms part of a series of bibliographies, now numbering 151, on various branches of science and technology, which are prepared by the Science Library in response to individual demand or on the occasion of special exhibitions. A complete list of titles is given at the end of this number. If these carefully prepared and extensive bibliographies were better known, they would save much time of research workers in collecting information on special subjects.

To reduce the cost of preparation the publications are issued in mimeographed form. Copies of this or any number may be obtained direct from the Science Museum, South Kensington, London, S.W.7.

"Handbook of Chemistry. A reference volume for all requiring ready access to chemical and physical data used in laboratory work and manufacturing." Compiled and edited by Norbert A. Lange, Ph.D. Assisted by Gordon M. Forker, B.S. An Appendix of Mathematical Tables and Formulas by Richard S. Burlington, Ph.D. Published by Handbook Publishers, Inc., Sandusky, O., 1934. Flexible covers, 5 by 8 inches, 1327 pages. Appendix. Indexed. Price $6.

This new handbook comprises instantly available, essential fact finding, time saving chemical tables, formulas, and other data for chemists, physicists, and others interested in research problems in chemistry, physics, engineering mathematics, etc. The book contains numerous outstanding new features of value and a workable index of over 2,500 listings covering 29 pages.

"Rubber Testing Experimental and Research Equipment." A. Gallenkamp & Co., Ltd., 17-29 Sun St. and 1-3 Clifton St., Finsbury Square, London, E.C.2, England.

This illustrated catalog lists and describes a full line of equipment for rubber laboratory testing, research, and analytical work.

NEW PUBLICATIONS

"Vulcan Fast Colors for Coloring Rubber." General Dyestuff Corp., 230 Fifth Ave., New York, N. Y. This booklet contains a collection of attractively colored vulcanized rubber samples cured with Vulcan fast colors in self shades and combinations. Paste and powder form colors are listed, and their resistance to hot and cold vulcanization and solubility in rubber, water, gasoline, and benzole recorded in tabular form.

"Handbook of the Rubber Exhibition." Science Museum, South Kensington, London, England, November, 1934-April, 1935. This handbook, besides enumerating the exhibits, gives an historical survey of the rubber industry and an account of the story of rubber from the growth of the rubber tree to the many applications of the product.

"Insulation Testing Equipment." Bulletin 934. Sound Engineering Corp., 416 N. Leavitt St., Chicago, Ill. This booklet illustrates and describes various special instruments adapted for the measurement of the effectiveness of electric insulation, dielectric strength, resistivity, and dielectric constant and power factor. It also contains reference to the wide range of special apparatus for indicating, controlling, and checking various industrial processes and problems.

The Vanderbilt News. The R. T. Vanderbilt Co., 230 Park Ave., New York, N. Y. Rubber chemists and technologists will prize their possession of the forthcoming November-December issue of the subject publication. Many months of research and compilation work will be represented by this large 4-section edition devoted to "Building a Rubber Compound." Section one comments descriptively on all principal compounding materials; while the second section deals with the particular properties and characteristics these various materials will impart to the rubber compound. The third covers the method of formulae development to obtain rubber compounds of certain special quality or property characteristics, and the final section treats of the electrical properties of various types of rubber compositions.

"Goodrich Practical Guide for Tire Combinations on 1½ Ton Trucks" and **"Goodrich Tire Calculator."** The B. F. Goodrich Co., Akron, O. Both the "Guide" and the "Calculator" make it a simple matter for any truck operator to determine the tire combination necessary to carry a given load on a truck in the 1½-ton classification. The guide gives complete directions for using the calculator and tells how to figure change-over savings and to choose the proper tire equipment.

"Bristol's Metameter for Telemetering" Bulletin No. 424. The Bristol Co., Waterbury, Conn. The features and principle of operation of the Metameter are illustrated and described in this booklet. This remarkable instrument conveys with precision accuracy by wireless measurements any distance even up to several thousand miles.

"Ball Brand Footwear Catalog 1934-35." Mishawaka Rubber & Woolen Mfg. Co., Mishawaka, Ind. New designs and constructions of all-weather rubber wear are shown in this fully illustrated catalog. Many lines of leather-upper rubber sole heavy hunting and work shoes are featured, as well as lightweight footwear for town use.

"The Industrial Hose Hand Book." By Edwin P. Rutan, for Electric Hose & Rubber Co., Wilmington, Del. This pocket-size booklet of 78 pages bears the sub-title, "A Reference Book for the Use of Purchasing Agents, Engineers, Superintendents, Master Mechanics, Foremen, Users, and Sellers." It is a hand book of original data and experience in hose installation and maintenance arranged in 5 parts: Kinds of Hose Used; The Industries Using Hose; Manufactures of Apparatus or Equipment Which Includes Hose; Other Users of Hose; Brands of Electric Hose; and an index: Hose Users.

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Rubber Industry in Europe

GREAT BRITAIN

Rubber Traffic Studs

Extensive experiments have been carried out in Middlesex with rubber studs for marking crossings for pedestrians; these studs have proved so satisfactory that they are now to be found in a number of towns in different parts of the county. Rubber studs have the advantage over steel studs of not only being safer (non-skid) and easier to see, but also of being cheaper.

At the annual general meeting of Harrisons & Crosfield, Ltd., the chairman, Eric Miller, in his speech made a suggestion regarding the extended use of rubber. He recommended the use of brightly colored rubber blocks or studs for traffic lines and expressed the hope that in view of the huge expenditure now being incurred on marking pedestrian crossings rubber would be given an opportunity to compete for the business. Probably owing to this suggestion as well as to the good results obtained in Middlesex, the Ministry of Transport in issuing new traffic regulations included white rubber blocks among the permissible materials for marking crossings.

It is now hoped that this move will stimulate the adoption of rubber for marking studs, thus providing a welcome additional outlet. Meanwhile, it is learned that the Westminster City Council, experimenting with different methods of marking, will also test rubber.

Rubber at Exhibitions

Two exhibitions, of interest also to the rubber manufacturer, were held in London in October: the Shoe and Leather Fair and the Automobile Show, at Olympia.

At the former, a wide variety of attractive and useful rubber footwear of practically every description was to be seen. Dunlop's new range of footwear has insoles of Dunlopillo cushioning; Goodyear showed its new high-grade rubber heels; its diamond-studded soles and heels were available in black, brown, oak, and ivory. Redfern's featured heels and soles in colored rubber to match the uppers of novelty shoes, also soles in 2 contrasting colors: one for the base and the other for the center panel; 4 different color combinations were on view. The Sussex Rubber Co., Ltd., also displayed soles and heels in colors to match shoes. Transparent, stick-on rubber soles, so light they will float, were the chief attraction at the stand of Bank Bridge Works, Ltd. These soles are invisible in wear and will not mark floors, it is claimed.

A new fabric for shoe uppers is Filastic, which claimed much attention. Filastic, a French invention, is of cotton impregnated with 50% of latex. Cloth woven from it is said to be tough and flexible as well as waterproof, and appears to have already found application in the manufacture of belting. For more decorative purposes, as in footwear, it is colored with fast-color paints by a special process, and any color can also be given a metallic luster. Necolastic cements with latex base are products of Nobel Chemical Finishes, Ltd. They are said to be suitable for all purposes, but are especially intended for joining rubber surfaces and for use wherever cellulose cements are not employed.

At the Automobile Show nothing particularly new in the way of tires was to be seen. It was noted, however, that buttressed treads of various types predominated; while cross-sections generally were larger. Several makers have concentrated on the reduction of noise and vibration in tires; Goodyear, for instance, featured its G3 silent tread tire; the British Tire & Rubber Co., Ltd., (formerly British Goodrich) showed Gilt-Edge tires with "Golden Ply" heat-resistant strip in the casing between the tread and the breaker strip; and Palmer displayed its Pilot range with treads specially designed to achieve silence and non-skid effects. Dunlop's new line of "90" tires is buttressed and has a more or less streamlined shape.

For insulating chassis sponge rubber, as produced by Ioco and Dunlop, is being increasingly used. At the Ioco stand appeared a range of rubber-proofed, so-called "Grandrille" fabrics obtainable in a variety of standard shades said to be color-fast. Another new Ioco product is Yzarine, a rubber-backed suede-like material.

British Notes

W. Siewertsz Van Reesema, director of the Rubber Cultuur Mij., is now also a director of the Rubber Powder Co., Ltd.

Filastic Ltd., London, has been registered as a private company to investigate the properties of rubber, yarn, and the like and to develop and exploit the commercial and industrial applications of rubber, yarn, etc. The company has a nominal capital of £100,000.

Following an order of the Minister of Transport that after dark every bicycle without a rear light must carry 12 square inches of white surface below the reflector, Dunlop has produced a white rubber tail flap to be fixed to the mudguard by 2 metal bands. Since about 10,000,000 cyclists are in the country and not more than ⅛ already carry either rear-lights or white tails, there has been a rush for the white tails, to supply which the manufacturers are working overtime.

The International Rubber Regulation Committee met for its monthly meeting on October 30. Colonel A. F. Townsend, who represents American rubber manufacturers on the Advisory Panel, was present. The question of the percentage of basic quotas to be fixed with effect from January 1, 1935, was discussed, but no agreement was reached, and the meeting was adjourned.

At the meeting held on November 3 the basic quota of 75% was fixed for January, February, and March, the first quarter of 1935. The next monthly meeting will be held on December 11, 1934.

GERMANY

Germany's Rubber Supply

What resources are open to a country which, like Germany, endeavors to render itself more or less independent of foreign rubber supplies, is a question which Prof. E. A. Hauser discusses in the *Frankfurter Zeitung*. First of all is reclaim; thanks to modern progress reclaim can now be used for making high grade goods, but it is necessary to educate the public, suspicious of goods with a low crude rubber content, that the wearing qualities of an article do not necessarily stand in direct relation to the percentage of new rubber utilized in its manufacture.

If new raw material is to be considered, then 4 ways are open to a country to supply itself. In the first place suitable rubber-bearing plants can be grown. America has made progress in this direction with her guayule plantations, and Russia appears to be succeeding—if slowly—with Tau-Sagiz and other rubber-bearing plants. Of late Italy has been investigating the possibilities of various growths in Southern Italy as sources of rubber. Germany is at a disadvantage as regards climate; nevertheless research here too might yield satisfactory results.

Then comes the production of synthetic rubber resembling the natural commodity in composition. Germany has been particularly successful here, and in this connection we may refer to a statement by Dr. Schacht (not mentioned in Professor Hauser's article), at the convention of the Verband der Mitteldeutschen Industrie held at

Weimar on October 29. He is quoted in the *Gummi-Zeitung* as saying:

"I believe that I am not saying too much when I here declare that during the last weeks the production of synthetic rubber has become successful."

A somewhat different tack may also be followed, and materials developed which, while not directly comparable with rubber as to composition, are more or less equal to it in regard to properties. The American product DuPrene is an example.

Finally other products can be chemically produced which have nothing in common with natural rubber, yet have properties which render them valuable to the rubber industry, as Thiokol, for instance. Though it is comparatively little elastic, it is considerably more resistant to oils and certain chemicals than rubber, consequently is replacing rubber in those fields where the latter had to be used for lack of a more suitable material.

In conclusion it may be added that Professor Hauser appears to favor the perfection of products which, while they may not resemble rubber in their composition, have similar properties, for thus the way is opened toward producing materials which may prove more suitable than natural rubber for special purposes.

Imports and Exports

Recent statistics show that the effect of the measures to control imports of crude rubber into Germany is making itself felt. Whereas the monthly average of imports in the first half of 1934 came to well over 60,000 quintals (the total for the 6 months was 393,879 quintals), crude rubber arrivals in September totaled only 28,381 quintals; for the first 9 months of 1934 the total was 517,292 quintals.

Exports of rubber manufactures in the aggregate continue to fall and for the period January-September, 1934, were 95,470 quintals, value 30,493,000 marks, against 103,280 quintals, value 35,305,000 marks, the year before. Figures for the separate items to September are not yet available, but from data for the first 8 months of 1934 it is clear that whatever the trend in other German rubber goods may be, exports of automobile tires and tubes are rising. For the 1934 period exports of automobile tire covers totaled 96,818 against 84,915, and of tubes, 68,672 against 64,186. This gain has been made despite a considerable drop in trade with Czechoslovakia and Switzerland, caused chiefly by import restrictions introduced in those countries. Outside of these 2 nations and Belgium, all other countries increased their tire business with Germany during the period under discussion. Probably in anticipation of the restrictive measures on foreign rubber goods, imports of these goods into Germany markedly increased in September, 1934, bringing the total for the first 9 months to 16,082, against 14,384 quintals in the same period of 1933.

European Notes

Russian scientists have followed different lines in their efforts to perfect a suitable synthetic rubber, and early in 1933 the construction of an experimental factory for Sovprene, a new type of synthetic rubber, was started. Sovprene resembles DuPrene, being also derived from chloroprene. The basic materials are coal and lime (from which acetylene is then formed) and hydrochloric acid. Sovprene, which can be worked exactly like natural rubber, is said to be equal to rubber in many respects and even to be superior in others. It has a tearing strength of 250 to 300 kg./cm.^{2}, elongation of 300 to 1,000%, and shows an X-ray picture similar to that of the natural article; requires only heat and hardly any sulphur for curing; is acid resistant and withstands oils, oxygen, and naphtha better than natural rubber; and is less pervious to helium and hydrogen.

Restriction of imports into Holland of various rubber goods including cycle tires and tubes helped local industry considerably in 1933. In that year 2 new rubber factories were added, bringing the total to 12; these gave employment to 2,164 workers against 1,828 the year before. The industry consumed a record of 2,358 tons of crude and 51 tons of scrap rubber in 1933 against 1,598 tons of crude and 27 tons of scrap rubber in 1932. Production included 2,943,000 cycle tires and 2,139,000 tubes against 2,435,000 tires and 1,732,000 tubes; also other rubber goods to a value of 2,660,000 guilders against 2,260,000 guilders. Although consumption of cycle tires and tubes continues to increase, imports tend to decrease, and in 1933 tires and tubes together came to 2,073,000 against 2,121,000 in 1932 and 2,530,000 in 1931. Exports of these goods have declined rapidly since 1930 when the total for tires and tubes was 1,755,000; in 1933 the total was only 727,000.

Protective tariffs in Austria are still inadequate says the Semperit Oesterreichisch-Amerikanische Gummiwerk A.G., Vienna; so the firm has requested the government further to raise duties on certain rubber items. Despite various difficulties, however, the concern was able to increase its net profits during the year to 170,000 schilling against 49,000 schilling. The amount will again be carried forward. Export business increased, and new products have met with success so that the firm could operate to 70% of capacity and employ about 4,500 workers as in the preceding year.

The Semperit concern now also markets pneumatic tires for horsedrawn vehicles.

Lauri Helso, engineer of the Suomen Rubber Mfg. Co., Nokia, Finland, recently returned to his official duties after a comprehensive tour of the leading rubber plants of New England and Ohio in the United States. The Suomen company manufactures tires, footwear, and a general line of mechanical goods, roll covering, and sundries.

New Jersey

(*Continued from page* 54)

The Rubber Manufacturers' Association of New Jersey will hold its annual meeting and dinner on December 11 at the Trenton Club, when officers will be chosen for the coming year. The present president is John A. Lambert, of the Acme Rubber Mfg. Co., Trenton.

Jos. Stokes Rubber Co., Trenton, has hired a night shift. Secretary-Treasurer Milton H. Martindell recently returned from a business trip through the Midwest.

Mercer Rubber Co., Hamilton Square, particularly busy on specialties, reports business conditions good. President William H. Sayen, following a trip to the Midwest, finds conditions are improving.

Whitehead Bros. Rubber Co., Trenton, is busy in all its mechanical departments, with production better in the shoe division. Superintendent William A. Howell was a member of the Mayor's Citizens' Committee which sponsored a recent ball at the Trenton Armory for the poor kiddies' Christmas fund.

Puritan Rubber Co., Trenton, functions 24 hours a day in some departments and with 2 shifts in others. The firm is working on large orders for rubber tiling. Company officials are optimistic over the future.

Pierce-Roberts Rubber Co., Trenton, is busy on orders for druggists' specialties. The company uses 2 shifts.

Murray Rubber Co., Trenton, is meeting with success in the manufacture of a new and heavier inner tube known as "Tri-Pli," which is higher priced than the regular Murray tubes.

Essex Rubber Co., Trenton, enjoyed a good summer and fall business, with the outlook for the winter much brighter than this time last year.

New Publications

(*Continued from page* 58)

"Patterson Ball, Tube, Rod Mills." The Patterson Foundry & Machine Co., East Liverpool, O. This catalog not only gives data on the company's line of mills, but contains as well brief articles on their function and versatility, open and closed circuit grinding, selection of the proper mill, etc.

"The Farm Chemurgic." By William J. Hale, research consultant, The Dow Chemical Co. This booklet is a discussion of the farm as a great chemurgical plant, that is, a plant concerned in the working with chemical compounds as the basic source of prosperity and future security of the nation.

"Neville Resin. For General Industrial Use." The Neville Co., Pittsburgh, Pa. This booklet covers the types, uses, grades, and specifications of Neville synthetic resins, also their properties, characteristics, blends, and application in various manufacturing industries such as varnish, rubber, adhesives, and others.

(*Concluded on page* 76)

Rubber Industry in Far East

NETHERLAND INDIA

Native Growers' Problems

Under the pen name Molensteen, a planter with many years' experience in Netherland India, especially as regards native affairs, discusses the restriction scheme in a series of articles in the *Algemeen Landbouwweekblad,* pointing out the defects particularly as it affects native outputs. In his opinion the special export duty is as unfair as it is unwise and will prove worse than futile. The high duty will provoke the native to still greater production and at the same time rouse in him a sense of injustice. The closest cooperation will arise between the native and the remiller, who is now getting more of the native product to work up than ever before; the present measures will result in the tappers on native holdings in the end becoming coolies of the American tire manufacturers, and the latter will, so to speak, presently be "bossing the rubber show" here.

To prevent this situation Molensteen suggests that instead of the export duty an order should be issued stopping all native tapping on certain days. This plan, he says, offers the only way of attaining the desired result and at the same time preserving the faith of the native in the government.

Against this viewpoint it is interesting to set the report by Mr. van Brakel, head of the Native Rubber Bureau, on his visit to Southern and Eastern Borneo. The heart of the native rubber industry in this division is Ulu Sungei, where 80% of the native rubber of the district is concentrated. At present prices only the most favorably situated holdings are being tapped by family labor; while other less advantageously situated lands, including many belonging to big land-owners, cannot be profitably exploited. The local rubber committee is largely in favor of abandoning the export duty for individual restriction, and native papers take the same stand. As a result of the campaign of the native press, various little political groups have taken up the rubber question and are influencing the natives. The owners of the larger gardens, which, as stated above, are still to a great extent untapped, belong to the most prosperous class and are also able to influence the lower classes of the population.

It is now suggested that all native gardens be registered to afford an idea of the potential output and the distribution of the holdings, to give a proper insight into the matter of individual restriction.

The division in question supplies wet slabs exclusively. These are bought by dealers and middlemen until they reach the local market finally to be sold for export or remilling. Because of the unfinished condition of the rubber, and the many hands through which it passes, the native gets only a very small share of the proceeds; so the authorities intend to teach the natives to use better methods of preparation to become less dependent on remillers. To this end it has been suggested to advance loans to growers to help them establish their own remilling factories.

At present, remilling is in the hands of a number of large and small Japanese and Chinese establishments. The chief of these are at Bandjermasin, namely, the Nomura, a Japanese concern and the Lie Rubber Ltd., a Chinese enterprise. The slabs are worked up into pale or smoked sheets and are exported chiefly to America and Japan. The Nomura company, incidentally, is also the biggest shipper here of this rubber.

Standard Production

The chairman of the Permanent Rubber Committee, H. J. Holst Pellekaan, states that to determine standard production for estate rubber for 1935, a new questionnaire will have to be filled in by 1,400 estates. Little hope, it seems, exists that a really accurately calculated standard production can be determined before 1936 although the worst defects of the present system of calculation will have been removed by 1935.

It is expected that 5 assessment committees will be appointed, one each for West, Central, and East Java, South Sumatra, and East Coast Sumatra. In the coming year a kind of right of appeal will be allowed those estates not satisfied with their standard production figure.

Testing Young Hevea

Various attempts to establish methods for recognizing superior yielders in the nursery beds have been made, without much success. Results were published recently of a test carried out on Wangoenredjo estate where, following the method used by tea growers, young Hevea plants were selected according to size. The idea, of course, was that by selecting the largest plants gardens of exclusively vigorous growers would be had, which would reach the tapping stage earlier than gardens of unselected nursery plants. For the test 100 of the largest one-year-old seedlings (from clone seed and mother tree seed) and, to check up, 100 of the smallest normal plants were planted in an open field January, 1931, so that a large and a small plant alternated. In January, 1934, all trees were measured again, and it was found that practically no difference was left; the small plants had caught up with the big ones. In other words, the size of a plant in the nursery is no criterion of its ultimate rate of growth.

Malaya

"It is dangerous to make prophecies about rubber, but considering that general world trade recovery is steadily gaining momentum, we strongly believe that the rubber growing industry will not suffer more than a 30% cut in production and that that cut will not be of long duration," says the *Times of Malaya,* basing its view on the ground that Mid-East producers used up too much bark during the slump and again in the desire to profit as much as possible by the price rise that followed when it was realized that a control scheme was near.

This condition may be true of Malaya, for despite the fact that numbers of estates closed down for more or less prolonged periods, production all through the slump was better maintained here than in any other producing area. But it does not logically follow, as the writer states, that: "The much-talked of huge outputs from native growers in the D.E.I. are, therefore, no more likely than huge outputs from Malayan native producers." It was precisely the natives in the Dutch colonies who curtailed production most heavily during the period of low prices, and as recent statistics show, now that prices are favorable, even the export duties that have been repeatedly raised are not enough to keep their exports within the limits of their quotas.

The labor question, however, probably has more to do with the low estate exports than anything else. Complaints of shortage have been loud and frequent, especially from Johore, where the situation is described as still being acute. No doubt as the labor supply increases, Malayan outputs will increase too.

A more interesting point made by the paper in question is that the majority of the trees on European estates in Malaya and Netherland India are old and that no really large new areas have been planted in the last 5 years. For it brings us face to face with the fact—frequently overlooked—that manufacturers will in future have to depend

more and more on budded rubber and native rubber for their supplies, and it would be hard to say which is the more uncertain source. For experience with budded rubber has really hardly begun; whatever the hopes for it may be, we have little, if anything, to prove how it would stand up over a prolonged period of commercial exploitation. It would therefore be important to know the extent of areas by age.

Ipoh Rubber Estates (1932), Ltd., proposes to increase its nominal capital of £40,000 to £75,000 to provide for purchasing the neighboring Gunong Kroh Estate and possible further amalgamation. Gunong Kroh will receive 214,295 shares of 2s. each.

The Tieng Seng rubber estate, part of the property left by the late Lee Kiah Soon, has been sold for $450,000 (Straits currency) to a Japanese concern, Consolidated Sange Koshi, Ltd.

Siam

When during the discussions of quotas for countries participating in the restriction scheme, the Siamese negotiators held out for 15,000 tons, this figure was granted not because it was admitted or expected that Siam was capable of this production, but simply to give Siam—important because easily accessible to smugglers—no excuse for staying out of the scheme. In Siam itself the quota was at first considered generous. But the higher prices have brought out considerably more rubber than Siam was thought able to produce. In July, for instance, the arrivals of Siam rubber in Malaya were 2,399 tons, chiefly dry. At this rate exports for a year would total around 28,000 tons. Now it is even claimed that Siam can produce 40,000 tons a year!

How, then, did Siam's negotiators come to claim a quota of only 15,000 tons? The Bangkok correspondent of the *Times of Malaya* gives an explanation, offered by the ex-Minister of Economics for Siam. It seems that customs figures had been accepted. But the rubber was never actually weighed by the customs as there was no duty on it; quantities were simply noted down as given by merchants, and the latter, wishing to escape freight charges, did not give the real figures.

In another issue of the same paper is an article by Gordon Dawson, of Yala, South Siam, in which the Siam rubber position is more fully set forth. Mr. Dawson bases his statements, he says, on considerable experience in the industry, many years' residence in South Siam, reliable information from producing centers, and another recent tour of inspection of native planted areas.

To begin with Mr. Dawson considers the quota of 15,000 tons a year ridiculous. According to him, 45% of the tappable area is not yet being tapped, and considering this point and the July exports, he puts the present potential production of rubber in Siam at not less than 40,000 tons and at 50,000 tons after the next 2 years. In view of the potential output and the generous quotas allowed other small producing countries, Mr. Dawson feels Siam would be selling the birthright of the natives here if she accepted a quota of less than 35,000 tons.

Rubber planting in Siam appears predominantly a native industry, with thousands of scattered small holdings, some of them almost inaccessible. The large estates seem centered in Pattani where are 4 big enterprises. The Bangnara estate has a monthly production of over 30,000 pounds and only ⅓ of the tappable area producing. The Yala Rubber Estate has 8-year-old rubber and is the only modern estate in Siam. Tapping here has not yet started as the property was expected to be sold, but now preparations are being made to erect the necessary buildings and install machinery. Besides are 2 more large Chinese-owned estates just brought into tapping.

A temporary shortage of labor is preventing tapping of thousands of small estates and the increase of production on others. Many small estates for years have been allowed to grow up in heavy undergrowth, which is now being cleared.

Officials in Siam have no conception whatever of the amount of rubber planted; there are no records of planted areas. To reach some of the holdings in the interior requires 2 to 3 days' travel by elephant through territory where no roads appear. This lack of roads is one of the disadvantages Siam producers suffer; they have besides a variety of taxes to pay, and there are duties on practically everything. Latex cups, for instance, are liable to a duty of 25%.

From Mr. Dawson's statements it would seem that we have in Siam almost a duplication, though on a small scale, of the situation in Netherland India, and if the rubber industry is to be spared disagreeable surprises, it would seem necessary to have regular reports on Siamese planting based on careful official inspections like those instituted in the Dutch colonies.

Marsden Campbell, Hardy's Chambers, 5 Hunter St., Sydney, Australia, is interested in American lines of sporting goods which might be handled in Australia.

Palestine imports during the first half of 1934 included tires, 121,561 kilos, value 18,188 Palestine pounds; soles, 46,315 kilos, value, 3,126 Palestine pounds; and other rubber goods to a value of 6,846 Palestine pounds.

INTERESTING LETTERS

Cleaning Rubber Floors

To the Editor: There is a rubber floor in this city which has baffled my attempts to free it clean of wax 4 months after it was applied. During that interval the floor was cleaned with clear water or with water containing a little soap in solution. The wax coating has become so hard that it can only be removed by scraping. Can you suggest an effective cleaning material that will remove the coating without injury to the surface of the rubber?

Frank Smith,
Building Superintendent.

Columbus, O.
October 5, 1934.

As a solution to this problem we offer the following suggestions:

1. Mix 2 parts wood alcohol to one part boiled linseed oil. With this mixture, well shaken, soak a small area of the tiling for about 3 minutes before wiping it off.

2. Mix 3 parts turpentine and one part olive oil and apply as in the above suggestion.

3. Apply a weak solution of lye (caustic soda) in water.

The Editor.

Advertise "Branded" Retreading Nationally

To the Editor: I enjoyed reading the discourse on "Retreading" which appeared in the September issue . . . and I found some worth-while ideas suggested in the article.

I believe retreading service could be branded and people taught to discriminate between a particular high-grade brand of retreading and the ordinary type of service in that line . . . provided . . . the service was properly merchandised to consumers through a business-like, aggressive advertising and sales promotional program. . . . Of course there would be the necessity of backing up the branded service with a high type of workmanship and real quality tire wear.

Robert M. Bowes,
Bowes Seal Fast Corp.

Indianapolis, Ind.
October 23, 1934.

"Vulcan F Dyestuffs for Hot and Cold Vulcanization." I. G. Farbenindustrie A. G., Frankfort a. M., Germany; agents, General Dyestuff Corp., New York, N. Y. This is a sample book of calendered thin rubber samples compounded in a large variety of dyestuffs. Also given are tabular data on fastness and solubilities of the colors.

Patents and Trade Marks

MACHINERY

United States

1,974,508. **Golf Ball Winder.** A. F. Pym, Beach Bluff, assignor to Sibley-Pym Corp., Lynn, both in Mass.

1,974,629. **Inner Tube Apparatus.** F. T. Roberts, Ridgewood, N. J., assignor to F. A. Daly, Pawtucket, R. I., trustee.

1,974,696. **Roll Grinder.** O. A. Swanson, Erie, Pa.

1,974,919. **Mold Engraver.** S. W. Harris and F. H. Jennings, both of Akron, and R. W. Sethman, Cuyahoga Falls, assignors to National Rubber Machinery Co., Akron, O.

1,975,038. **Core.** I. W. Glazner, Brooklyn, N. Y.

1,975,149. **Tire Repair Vulcanizer.** J. C. Heintz, Lakewood, O.

1,975,195. **Coating Apparatus.** C. H. Dennison, Quincy, assignor to American Rubber Co., Cambridge, Mass.

1,975,219. **Bias Cutter.** H. S. Alexander and F. B. Pfeiffer, both of Akron, and J. W. White, Wadsworth, all in O., assignors to Seiberling Rubber Co., a corporation of Del.

1,975,665. **Tube Repair Vulcanizer.** A. C. Rhoades, Piedmont, Kan.

1,975,930. **Tire Groover.** W. F. Errig, Philadelphia, and G. M. Pfundt, Churchville, both in Pa.

1,976,328. **Elastic Yarn Apparatus.** H. Z. Cobb, assignor to Revere Rubber Co., both of Providence, R. I.

1,976,344. **Elastic Thread Apparatus.** E. Hopkinson, New York, N. Y., assignor to Revere Rubber Co., Providence, R. I.

1,976,348. **Rubber Thread Apparatus.** E. J. Joss, Bristol, assignor to Revere Rubber Co., Providence, both in R. I.

1,976,365. **Gaiter Last.** C. A. Ostling, New York, N. Y., and F. Zonino, Naugatuck, Conn., assignors, by mesne assignments, to Goodyear's India Rubber Glove Mfg. Co., Naugatuck, Conn.

1,976,502. **Latex Treating Vessel.** A. R. Kemp, Westwood, N. J., assignor to Bell Telephone Laboratories, Inc., New York, N. Y.

1,976,740. **Inflated Article Apparatus.** C. S. McChesney, Kenmore, assignor to Dunlop Tire & Rubber Corp., Buffalo, both in N. Y.

1,976,833. **Toggle Molding Press.** J. W. Brundage, assignor to Summit Mold & Machine Co., Akron, O.

1,976,972. **Cutter.** W. L. Valiquette, Dayton, O.

1,977,008. **Automatic Dipping System.** A. Neher, Chicago, Ill., assignor to Louden Machinery Co., Fairfield, Iowa.

1,977,018. **Pneumatic Tire Builder.** A. H. Shoemaker, Seattle, Wash.

1,977,052. **Chewing Gum Machine.** F. A. Garbutt, Los Angeles, Calif.

1,977,118. **Inner Tube Vulcanizing Mold.** P. De Mattia, Passaic, N. J., assignor to National Rubber Machinery Co., a corporation of O.

1,977,119. **Vulcanizer.** P. De Mattia, Passaic, N. J., assignor to National Rubber Machinery Co., Akron, O.

1,977,563. **Continuous Vulcanizer.** A. L. Wallace, Brooklyn, N. Y.

Dominion of Canada

345,181. **Centrifugal Separator Bowl.** De Laval Separator Co., New York, assignee of G. J. Strezynski, Poughkeepsie, both in N. Y., U. S. A.

345,182. **Centrifuge Feed Tube.** De Laval Separator Co., New York, assignee of A. E. Flowers and G. J. Strezynski, co-inventors, both of Poughkeepsie, all in N. Y., U. S. A.

United Kingdom

411,184. **Tire Groover.** W. F. Errig, Philadelphia, and G. M. Pfundt, Churchville, both in Pa., U. S. A.

411,956. **Vulcanizing Mold.** Dunlop Rubber Co., Ltd., London, and T. Norcross, Birmingham.

411,961. **Bathing Cap Die Stamp.** I. and L. Dorogi and Dr. Dorogi Es Tarsa Gummigyar R. T., all of Budapest, Hungary.

412,249. **Latex Applier.** United Shoe Machinery Corp., Boston, assignee of T. J. Doyle, Lynn, both in Mass., U. S. A.

412,259. **Boot Trimmer.** British United Shoe Machinery Co., Ltd., Leicester, assignee of C. G. Brostrom, Lynn, Mass., U. S. A.

412,340. **Hot Water Bottle Dipping Form.** Dunlop Rubber Co., Ltd., London, and G. W. Trobridge, Birmingham.

412,750. **Golf Ball Mold.** Dunlop Rubber Co., Ltd., London, and H. Willshaw, Birmingham.

412,971. **Tennis Ball Grader.** E. J. Hiscock, Trowbridge.

413,284. **Fabric Coater.** Dunlop Rubber Co., Ltd., London, and E. W. Madge and F. J. Payne, both of Birmingham.

413,299. **Belt Impregnating Apparatus.** N. Lawson, Glamorgan, and Lewis & Tylor, Ltd., Cardiff, both in Wales.

413,420. **Tire Groover.** T. Gare, Stockport.

Germany

604,427. **Insulated Wire Tester.** Hoppen & Co., Rodenkirchen a.Rh.

605,259. **Apparatus to Make Metal Strips to Be Rubber and Fabric Covered.** J. S. Reid, Shaker Heights, O., U. S. A. Represented by B. Kugelmann, Berlin.

PROCESS

United States

1,974,548. **Toy Sets.** A. Somogyi, assignor to Magyar Ruggyantaarugyar Reszvenytarsasag, Budapest, Hungary.

1,974,594. **Reenforcing Paper.** E. H. Angier, Framingham, Mass., assignor to E. H. Angier, as trustee.

1,974,879. **Latex Impregnating Textiles.** J. Duarry-Serra, Barcelona, Spain.

1,975,841. **Packing Tin Plates.** H. S. Gifford, Brooklands, England, assignor to Dunlop Rubber Co., Ltd., a British company.

1,975,867. **Printing Plate.** W. Saunders, Baldwin, N. Y.

1,976,798. **Rubber Bonded Abrasive Article.** C. S. Nelson, Niagara Falls, N. Y., and G. H. Porter, Pittsfield, Mass., assignors to Carborundum Co., Niagara Falls, N. Y.

1,977,108. **Belting.** W. T. Arnberg, Kommunalhuset, Liljeholmen, Sweden.

1,977,207. **Finishing an Elastic Fabric Edge.** D. Rhee, assignor to Carr Mfg. Corp., both of Bristol, R. I.

1,977,209. **Electric Cable.** A. Sargent, assignor to Macintosh Cable Co., Ltd., both of Derby, England.

1,977,281. **Inner Tube.** A. S. Knowlton, Cuyahoga Falls, assignor to General Tire & Rubber Co., Akron, both in O.

1,977,576. **High-Heeled Footwear.** H. C. L. Dunker, Helsingborg, Sweden.

Dominion of Canada

344,860. **Flexible Brush Back.** W. Wessel, Jr., Remscheid, Germany.

344,913. **Floor Covering.** Linoleum Mfg. Co., Ltd., assignee of A. A. Godfrey, both of London, England.

344,953. **Rubber and Metal Bonding.** R. J. Reaney, assignee of T. R. Griffith, both of Ottawa, Ont.

344,957. **Elastic Webbing.** G. S. Vanvoorhis, Northampton, Mass., U. S. A.

345,006. **Sole Cementing.** A. L. Murray, Auburn, Ind., U. S. A.

345,227. **Porous Rubber.** Societa Italiana Pirelli, assignee of M. Faldini, both of Milan, Italy.

345,276. **Cushion Shoe.** J. F. Gilkerson, Milwaukee, Wis., U. S. A.

345,309. **Tire Tube.** J. W. Waber, Chicago, Ill., U. S. A.

United Kingdom

411,329. **Printing Plate.** M. Joachimczyk, (trading as Tellschow Maschinenfabrik, Geb.), Berlin, Germany.

411,685 and 411,695. **Insulated Conductor.** R. F. McKay, Birmingham. (International Latex Processes, Ltd., St. Peter's Port, Channel Islands.)

411,817. **Printing Plate.** T. C. Browne, Hinsdale, Ill., U. S. A.

411,887. **Filter Cloth.** L. S. M. Lejeune, Nord, and J. E. C. Bongrand, Paris, both in France.

411,938. **Netting.** L. S. M. Lejeune, Nord, and J. E. C. Bongrand, Paris, both in France.

411,939. **Latex Impregnated Yarn.** L. S. M. Lejeune, Nord, and J. E. C. Bongrand, Paris, both in France.

412,130. **Suction Rolls.** Dominion Engineering Works, Ltd., Montreal, P. Q., Canada.

412,229. **Friction Clutch Material.** L. S. M. Lejeune, Nord, and J. E. C. Bongrand, Paris, both in France.

412,256. **Shock Absorbing Sheet.** L. S. M. Lejeune, Nord, and J. E. C. Bongrand, Paris, both in France.

412,278. **Inflatable Toy Figure.** F. Nadherny, Vienna, Austria.

412,371. **Attaching Rubber to Fabric.** Magyar Ruggyantaarugyar Reszveny-

tarsasag and I. and L. Dorogi, all of Budapest, Hungary.

412,555. **V-Belt.** F. W. Alexander, Cardiff, Wales, and A. K. Aitken, Glasgow, Scotland.

412,884. **Accumulator Separator.** Accumulatoren-Fabrik A. G., Berlin, Germany.

412,924. **Girdle.** C. E. Pecknold, Vancouver, Canada.

413,849. **Tennis Ball.** International Latex Processes, Ltd., St. Peter's Port, Channel Islands, and D. F. Twiss and W. McCowan, both of Birmingham.

413,955. **Toy.** International Latex Processes, Ltd., St. Peter's Port, Channel Islands.

414,186. **Electroplating Dentures.** O. Schweigert, Pforzheim, Germany.

414,205. **Transfers and Prints.** International Latex Processes, Ltd., St. Peter's Port, Channel Islands, and J. S. Tidmus, Birmingham.

Germany

603,838. **Footwear Manufacture.** H. C. L. Dunker, Helsingborg, Sweden. Represented by A. Pieper, Essen.

605,260. **Producing Golf Balls.** Dunlop Rubber Co., Ltd., London, England, and Anode Rubber Co., Ltd., Guernsey, Channel Islands. Represented by C. Wiegand, Berlin.

CHEMICAL

United States

1,975,167. **Ketone-Amines.** L. Meuser, assignor to Naugatuck Chemical Co., both of Naugatuck, Conn.

1,975,179. **Styrol Varnish.** O. H. Smith, W. Englewood, N. J., assignor to Naugatuck Chemical Co., Naugatuck, Conn.

1,975,447. **Chewing Gum Material.** F. V. Canning, assignor to Sweets Laboratories, Inc., both of New York, N. Y.

1,975,582. **Lubricating Grease.** E. N. Klemgard, Martinez, assignor, by mesne assignments, to Shell Development Co., San Francisco, both in Calif.

1,975,588. **Accelerator.** D. H. Powers, Pennsgrove, N. J., assignor to E. I. du Pont de Nemours & Co., Wilmington, Del.

1,975,734. **Age Resister.** W. L. Semon, Silver Lake Village, O., assignor to B. F. Goodrich Co., New York, N. Y.

1,975,980. **Age Resister.** A. W. Sloan, Akron, O., assignor to B. F. Goodrich Co., New York, N. Y.

1,976,327. **Reclaiming Rubber.** F. D. Chittenden, Nutley, N. J., assignor to Rubber Regenerating Co., Naugatuck, Conn.

1,976,394. **Latex Rubber Product.** J. Helfrich, Westfield, N. J.

1,976,774. **Chewing Gum Product.** C. Ellis, Montclair, N. J., assignor to Standard Oil Development Co.

1,976,946. **Acoustic Tile.** M. H. Kliefoth, assignor to C. F. Burgess Laboratories, Inc., both of Madison, Wis.

1,977,059. **Chewing Gum Base.** G. A. Hatherell, Burbank, assignor to F. A. Garbutt, Los Angeles, both in Calif.

1,977,211. **Latex Composition.** M. O. Schur, assignor to Brown Co., both of Berlin, N. H.

Dominion of Canada

344,889. **Rubber Adhesive.** Dominion Rubber Co., Ltd., Montreal, P. Q., assignee of W. W. Dunfield, Yonkers, N. Y., U. S. A.

344,890. **Accelerator.** Dominion Rubber Co., Ltd., Montreal, P. Q., assignee of H. O. Newman, Waterbury, Conn., U. S. A.

344,901. **Hydrogenation of Heterocyclic Compounds.** Goodyear Tire & Rubber Co., Akron, O., assignee of H. Adkins, Madison, Wis., and H. I. Cramer, Cuyahoga Falls, O., co-inventors, all in the U. S. A.

344,902. **Accelerator.** Goodyear Tire & Rubber Co., Akron, assignee of L. B. Sebrell and A. M. Clifford, co-inventors, both of Stow, all in O., U. S. A.

344,903. **Antioxidant.** Goodyear Tire & Rubber Co., Akron, assignee of A. M. Clifford, Stow, both in O., U. S. A.

344,904. **Accelerator.** Goodyear Tire & Rubber Co., assignee of H. R. Thies, both of Akron, O., U. S. A.

345,108. **Age Resister.** I. Williams, Woodstown, W. A. Douglass, Pennsgrove, both in N. J., and A. M. Neal, Wilmington, Del., co-inventors, all in the U. S. A.

345,242. **Rubber Conversion Product.** Walpamur Co., Ltd., London, assignee of F. S. Shadbolt, Darwen, co-inventors, both in England.

United Kingdom

411,860. **Molding Composition.** F. B. Dehn, London. (Röhm & Haas A. G., Darmstadt, Germany.)

411,983. **Rubber Composition.** New-York Hamburger Gummi-Waaren Cie., Hamburg, Germany.

412,301. **Rubber Composition.** J. Y. Johnson, London. (I. G. Farbenindustrie A. G., Frankfurt a. M., Germany.)

412,305. **Organic Sulphides.** Henkel & Cie., Ges., Düsseldorf, Germany.

412,349. **Rubber Composition.** Dunlop Rubber Co., Ltd., London, and D. F. Twiss and A. E. T. Neale, both of Birmingham.

412,514. **Latex.** Metallges. A. G., Frankfurt a. M., Germany.

412,525. **Chlorinated Rubber Dispersions.** Chemische Fabrik Buckau, Saalkreis, Germany.

412,634. **Adhesive Material.** Imperial Chemical Industries, Ltd., London, and H. M. Bunbury, R. B. F. F. Clarke, and W. J. R. Evans, all of Manchester.

412,635. **Accelerator.** I. G. Farbenindustrie A. G., Frankfurt a. M., Germany.

412,752. **Latex.** Dunlop Rubber Co., Ltd., London, and D. F. Twiss and E. W. B. Owen, both of Birmingham.

412,914. **Amines.** Goodyear Tire & Rubber Co., Akron, O., U. S. A.

412,992. **Coloring Rubber.** J. Y. Johnson, London. (I. G. Farbenindustrie A. G., Frankfurt a. M., Germany.)

412,995. **Insulated Conductor.** Telegraph Construction & Maintenance Co., Ltd., London, J. N. Dean, Orpington, and H. F. Wilson, London.

413,012. **Age Resister.** Imperial Chemical Industries, Ltd., London, and W. Baird, M. Jones, and W. J. S. Naunton, all of Manchester.

413,282. **Accelerator.** Goodyear Tire & Rubber Co., Akron, O., U. S. A.

413,296. **Accelerator.** Dunlop Rubber Co., Ltd., London, and D. F. Twiss and F. A. Jones, both of Birmingham.

413,463. **Waterproofing Composition.** W. Anderson, Edinburgh, Scotland.

413,666. **Latex.** E. I. du Pont de Nemours & Co., Wilmington, Del., U. S. A.

Germany

604,299. **Coloring Rubber.** I. G. Farbenindustrie A.G., Frankfurt a.M.

605,150. **Obtaining Rubber and Rubber Articles.** Continental Gummiwerke A.G., Hannover.

GENERAL

United States

1,974,461. **Fender Flap Clamp.** W. C. Jackson, assignor to Tingley-Reliance Rubber Corp., both of Rahway, N. J.

1,974,476. **Inflating Coupling.** J. Wahl, Rosedale, assignor to A. Schrader's Son, Inc., Brooklyn, both in N. Y.

1,974,486. **Stamping Device.** H. E. Edwards, Brookline, and G. S. Tolman, Jr., Braintree, both in Mass., assignors to United Shoe Machinery Corp., Paterson, N. J.

1,974,546. **Drill Pipe Protector.** M. R. Shipley, Hermosa Beach, assignor, by mesne assignments, to E. M. Smith, Los Angeles, both in Calif.

1,974,559. **Trouser Support.** G. W. Barnes, St. Louis Park, Minn.

1,974,616. **Athletic Glove.** K. K. Kirkham, Ames, Iowa.

1,974,633. **Gasket.** B. J. Victor, Oak Park, assignor to Victor Mfg. & Gasket Co., Chicago, both in Ill.

1,974,638. **Weather Strip Anticreeping Device.** R. T. Axe, assignor, by mesne assignments, to Syracuse Trust Co., trustee, both of Syracuse, N. Y.

1,974,712. **Submarine Cable.** K. Goes, Rosrath, and E. Badum, Cologne-Mulheim, assignors to Felten & Guilleaume Carlswerk A. G., Cologne-Mulheim, all in Germany.

1,974,790. **Electrical Connecter.** W. L. Barth, Venice, Calif.

1,974,906. **Tire Deflation Indicator.** G. B. Willcox, Saginaw, Mich.

1,975,016. **Sponge Cup and Applicator.** L. Nassif, Wheeling, W. Va.

1,975,145. **Vibration Absorbing Connecter.** H. D. Geyer, Dayton, O., assignor, by mesne assignments, to General Motors Corp., Detroit, Mich.

1,975,253. **Package.** M. J. Connolly, Washington, D. C., assignor, by mesne assignments, to American Cyanamid & Chemical Corp., a corporation of Del.

1,975,262. **Swing Seat.** W. B. Evans, F. C. Garratt, Jr., and E. F. Hoppes, assignors to Everwear Mfg. Co., all of Springfield, O.

1,975,354. **Electrical Connecter.** H. A. Douglas, Bronson, Mich.

1,975,405. **Saddle Seat.** H. M. Pryale, Pontiac, Mich., assignor to Baldwin Rubber Co., a corporation of Mich.

1,975,415. **Valve Stem.** S. T. Williams, Bellerose, assignor to A. Schrader's Son, Inc., Brooklyn, both in N. Y.

1,975,451. **Cleaning Implement.** S. J. Dunaway, assignor to Expello Corp., both of Dover, N. H.

1,975,488. **Duplicating Device.** W. Trull and L. Clement, both of Cranford, N. J.

1,975,554. **Garbage Can.** T. M. Morrissey, Dunkirk, N. Y.

1,975,583. **Acid Resisting Pump.** H. Latham, Othello, Wash.

1,975,585. **Window Cleaner.** L. Koukal, New York, N. Y.

1,975,597. **Boot.** C. F. Berry, Boston, Mass.

1,975,602. **Cable Insulating Sleeve.** H. Halperin and A. P. Thoms, both of Chicago, Ill.

1,975,639. **Dash Tire Pressure Indicator.** E. Greene, Montclair, N. J.
1,975,688. **Garment.** A. Graves, Salt Lake City, Utah.
1,975,713. **Brake Shoe Assembly.** G. Christenson, Plainfield, N. J., assignor to Johns-Manville Corp., New York, N. Y.
1,975,735. **Stocking.** A. E. Vaughan, Jr., assignor to Vaughan Knitting Co., both of Pottstown, Pa.
1,975,802. **Inner Tube.** A. D. Robertson, Davidson Co., Tenn.
1,975,881 and 1,975,882. **Railway Wheel Assembly.** G. A. Ungar, Pelham Manor, assignor to E. K. Howe, New York, both in N. Y.
1,975,885. **Wire Connecter.** C. E. Wellman, assignor to Ford Motor Co., both of Dearborn, Mich.
1,975,895. **Sealed Double-Pane Glass and Frame.** H. D. Geyer, Dayton, O., assignor, by mesne assignments, to General Motors Corp., Detroit, Mich.
1,975,960. **Engine Mounting.** R. K. Lee, Highland Park, assignor to Chrysler Corp., Detroit, both in Mich.
1,976,063. **Friction Clutch.** E. R. Evans, assignor to Borg & Beck Co., both of Chicago, Ill.
1,976,154. **Vehicle Ground Contact.** H. Walters, Detroit, Mich.
1,976,235. **Tire.** S. F. Lawrence, New York, N. Y.
1,976,254. **Hand Stamp Mount.** J. Cooke, Omaha, Neb.
1,976,329. **Waterproof and Puncture-proof Paper.** L. G. Copeman, assignor to Copeman Laboratories Co., both of Flint, Mich.
1,976,389. **Shoe.** J. H. Everston, Milwaukee, Wis.
1,976,411. **Hot Handle Holder.** G. L. Olson, Arlington, Mass.
1,976,441. **Cushion Foot and Arch Support.** J. Feldman, Quincy, Ill.
1,976,589. **Pipe Joint.** W. W. Trickey, assignor to Lock Joint Pipe Co., both of E. Orange, N. J.
1,976,604. **Garter Fastener.** O. J. Drews, assignor of 1% to I. C. Thuermann, 49% to W. J. Thuermann, and 1% to I. Drews, all of Milwaukee, Wis.
1,976,623. **Jar Clamping Tool.** S. G. Monroe and F. Shepherd, both of Akron, O.
1,976,656. **Arch Supporter.** O. D. Clark, Chelsea, Mass.
1,976,667. **Pencil Eraser Attachment.** W. C. Henwood, assignor of ½ to G. F. Atwood, both of Portland, Ore.
1,976,710. **Tomato Peeler.** V. Carpentieri, Mercato St. Severino, Italy.
1,976,789. **Vibration Damper.** R. K. Lee, assignor to Chrysler Corp., both of Detroit, Mich.
1,976,804. **Cable.** A. Ringel, Merchantville, N. J., assignor to Radio Corp. of America, a corporation of Del.
1,976,819. **Arch Support.** L. G. Weiler, Bronx, N. Y.
1,977,137. **Buttonhole Fabric.** T. F. Moore, assignor to George C. Moore Co., both of Westerly, R. I.
1,977,142. **Fishing Reel.** C. T. Pflueger, assignor to Enterprise Mfg. Co., both of Akron, O.
1,977,227. **Self-Closing Paste Tube.** A. Berendt, New York, N. Y.
1,977,387. **Rail Wheel.** M. Howald, Massillon, assignor of ¼ to W. Herbruck, Canton, both in O.
1,977,415. **Pedal Pad.** J. R. Thorp, assignor to Fulton Co., both of W. Allis, Wis.
1,977,465. **Woman's Slip.** H. Aronson, New York, N. Y.
1,977,499. **Electrolytic Apparatus.** M. Tetrault, Great Falls, Mont.
1,977,528. **Separable Fastener Slider.** V. Puc, Prague, assignor to Waldes & Co., Prague-Vrsovice, both in Czechoslovakia.
1,977,531. **Typewriter Platen.** J. H. Sperry, Jamaica Plain, Mass.
1,977,547. **Vehicle Suspension.** A. E. Forsyth, assignor to Forsyth Automotive Pneumatic Spring, Ltd., both of Ottawa, Ont., Canada.
1,977,565. **Packing Device.** D. R. Yarnall, assignor to Yarnall-Waring Co., both of Philadelphia, Pa.

Dominion of Canada

344,798. **Shoe.** H. Zalkind and N. Cohen, co-inventors, both of Montreal, P. Q.
344,820. **Tire.** H. B. Gillette, deceased, in his lifetime of Eau Claire, Wis., U. S. A.
344,872. **Filter Press.** Blomfield Engineering Co., Ltd., London, assignee of H. T. Durant, Crawley, both in England.
344,885. **Container.** Crown Cork & Seal Co., Inc., assignee of C. J. Parker, both of Baltimore, Md., U. S. A.
344,906. **Footwear.** Hood Rubber Co., Inc., Wilmington, Del., assignee of B. F. Goodrich Co., New York, N. Y., assignee of F. J. MacDonald, Brookline, Mass., all in the U. S. A.
344,974. **Tire Tube.** C. Bradley, Nashville, Tenn., U. S. A.
344,979. **Container.** J. F. Crowley, London, England.
345,004. **Garment.** C. E. Martin, Minneapolis, Minn., U. S. A.
345,012 and 345,013. **Motor Vehicle.** S. Smith, Chobham, England.
345,019. **Arch Support.** M. G. Waksmundzka, Washington, D. C., U. S. A.
345,021. **High Pressure Lubricating Device.** P. Würzburger, Wiesbaden, Germany.
345,028. **Filter.** Blomfield Engineering Co., Ltd., London, assignee of H. T. Durant, Crawley, and E. O. Stubbings, Carshalton, co-inventors, all in England.
345,093. **Corset.** Warner Brothers Co., Bridgeport, assignee of J. Field, Fairfield, both in Conn., U. S. A.
345,117. **Tire Valve.** W. T. Conrad, Lawndale, Calif., U. S. A.
345,251. **Windshield Wiper.** D. Kuskin, Long Island, N. Y., U. S. A.
345,254. **Railway and Tramway Track.** B. S. Davies, Woking, and P. A. Summers, Osterley, co-inventors, both in England.
345,277. **Heel.** C. Hall, Jr., Mexico City, Mexico.
345,306. **Brush.** W. A. Schwab, Chicago, Ill., U. S. A.
345,408. **Seat Cushion.** La Société H. & F. de Poix & Cie., assignee of F. M. J. T. de Poix, both of Rueil, Seine et Oise, France.
345,415. **Football.** William Sykes, Ltd., Horbury, assignee of W. J. Wycherley, Ossett, both in England.
345,437. **Eraser.** Wahl Co., assignee of K. A. Garvey, both of Chicago, Ill., U. S. A.

United Kingdom

410,532. **Aircraft.** J. De La Cierva, London.
410,675. **Sound-Insulated Door.** E. J. Van De Ven, Brussels, Belgium.
410,987. **Hair Curler.** H. Schramm, Berlin, Germany.
411,055. **Piston.** J. A. A. Casas, Barcelona, Spain.
411,056. **Outboard Motor.** Fichtel & Sachs A. G., Schweinfurt, Germany.
411,106. **Permanent Waving Apparatus.** C. Ronzi, Zürich, Switzerland.
411,157. **Bedstead.** A. Pupier, Paris, France.
411,258. **Bitumen Distributer for Roads.** J. Duffy, Barking.
411,310. **Actuating Valve.** J. H. Ewart, London.
411,317. **Bucket.** W. Bradley, Derby.
411,436. **Window Regulator.** Ternstedt Mfg. Co., assignee of J. W. Lakin, both of Detroit, Mich., U. S. A., and H. C. Field, Windsor, Ont., Canada.
411,454. **Draught Excluder.** M. Emonds, Cologne, Germany.
411,545. **Nailing and Stapling Hand Tool.** Boston Wire Stitcher Co., E. Greenwich, R. I., U. S. A.
411,571. **Shoulder Pad.** J. Entwisle, Letchworth.
411,582. **Boot.** F. A. Wood, London.
411,592. **Safety Razor.** W. G. S. Tighe, London.
411,609. **Windscreen Draught Excluder.** Standard Motor Co., Ltd., and E. A. Green, both of Coventry.
411,622. **Flexible Unjointed Hinge.** B. M. Middleton, Allendale.
411,634. **Draught Excluder.** D. J. Hull, Hadleigh.
411,691. **Endless Belt Conveyer.** Etablissements A. Derome Soc. Anon., Nord, France.
411,712. **Air Cushion.** Magyar Ruggyantaarugyar Reszvenytarsasag and I. and L. Dorogi, all of Budapest, Hungary.
411,764. **Heel.** A. Stone, Pontnewynydd.
411,848. **Engine Mounting.** R. S. Trott, Denver, Colo., U. S. A.
411,864. **Fluid Pressure Brake.** Hydraulic Brake Co., Detroit, Mich., U. S. A.
411,874. **Pneumatic Tire.** Seiberling Rubber Co., Barberton, assignee of K. B. Kilborn, Fairlawn, both in O., U. S. A.
411,917. **Football.** F. G. Webber, London.
411,941. **Vehicle Window.** E. J. Rawlings, A. E. Dutfield, and Rawlings Mfg. Co., Ltd., all of London.
411,953. **Vehicle Spring Suspension.** F. G. G. Armstrong, Beverley.
411,968. **Railway Vehicle Buffer.** G. Spencer Moulton & Co., Ltd., and J. C. Spencer, both of Westminster.
411,988. **Leak Stopping Device.** A.T.S. Co., Ltd., and H. N. Wylie, both of London, and J. Lloyd, Coventry.
412,038. **Aircraft Landing Gear.** G. M. Clark, London. (Seversky Aircraft Corp., New York, N. Y., U. S. A.)
412,041. **Trousers.** J. A. Wilkinson, Wellington, New Zealand.
412,059. **Ball and Float Valve.** G. E. Essex, Llandudno.
412,084. **Cabin Panel.** H. B. Boyd, Romford.
412,106. **Toy Target.** H. Paulsen, Copenhagen, Denmark.
412,141. **Toilet Paper Holder.** E. Koci, K. Weber, and A. Materno, (trading as Oesterreichische Papier & Papierwaren Handelges. Koller & Co.), all of Vienna, Austria.
412,168. **Treating Textiles.** V. R. Ullman and T. McLachlan, both of London.
412,195 and 412,203. **Motor Vehicle.** S. Smith, Chobham.
412,204. **Vehicle Suspension.** S. Smith, Chobham.
412,245. **Air Cushion.** Self-Controlled Air Cushion Co., Ltd., and F. Mitchell, both of Newton Heath.

412,253. **Condenser.** Electric & Musical Industries, Ltd., Hayes, and R. I. Kinross, London.
412,258. **Fountain Pen.** L. H. Ashmore, Collingswood, N. J., U. S. A.
412,263. **Battery.** C. K. Bamber, London.
412,269. **Flax Cleaner.** F. P. Gardner, New York, N. Y., U. S. A.
412,287. **Pneumatic Single Stroke Apparatus.** V. A. Trier, London.
412,296. **Gramophone Pick-up.** E. E. Symonds, Walton-on-Thames.
412,374. **Sprayer.** F. Ries, Munich, Germany.
412,376. **Pencil Holder.** F. C. Bina and F. F. Barrey, both of London.
412,419. **Rope.** A. Robertson, Aberdeen, Scotland.
412,436. **Massage Apparatus.** R. Bosch A. G., Stuttgart, Germany.
412,437. **Golf Club.** H. D. Fitzpatrick, Glasgow, Scotland, and Clifton, Ltd., Douglas, Isle of Man.
412,459. **Piston Packing.** F. Bopp Von Oberstadt, Peter Franz, Graf, and Liebhold, Berlin, Germany.
412,475. **Railway Vehicle Undercarriage.** A. Rellwage, Berlin, Germany.
412,478. **Vehicle Spring Suspension.** Daimler-Benz A. G., Stuttgart, Germany.
412,512. **Paper Rose Machine.** O. V. Jonsson, Hälsingborg, Sweden, and A. K. Nielsen, Odense, Denmark.
412,575. **Body Confining Garment.** Kops Bros., Inc., assignee of W. Kops, both of New York, N. Y., U. S. A.
412,603. **Shaving Brush.** E. I. M. Sawrey-Cookson, London. (Representative of S. S. Sawrey-Cookson.)
412,623. **Key Case.** F. Hartman, London.
412,624. **Shock Absorber.** A. H. Stevens, London. (Spicer Mfg. Corp., Toledo, O., U. S. A.)
412,625. **Separator Diaphragm for Accumulators.** Cie. Generale D'Electricite, Paris, France.
412,631. **Wall Plug.** W. W. Hamill, Four Oaks.
412,641. **Electroplating.** H. Van Der Horst, Hilversum, Holland.
412,676. **Gas Bag.** S. F. Owen and Spring Rod Co., Ltd., both of Blackburn.
412,685. **Electroplating.** J. Kronsbein and C. F. Neale, both of Birmingham.
412,703. **Spare Tire Cover.** Wilmot-Breeden, Ltd., and H. J. Spicer, both of Birmingham.
412,718. **Rack Stand.** G. G. and L. S. Houghton, (trading as A. B. & G. G. Houghton), both of Birmingham.
412,731. **Vehicle Wheel.** Michelin & Cie., Clermont Ferrand, Puy-de-Dome, France.
412,742. **Vehicle Floor Covering.** A. Riley and A. Rush, both of Coventry.
412,796. **Cable.** Norddeutsche Seekabelwerke A. G., Oldenburg, Germany.
412,826. **Bottle Corker.** J. W. Flower, Dorset.
412,840. **Battery.** Britannia Batteries, Ltd., London, assignee of Accumulatoren-Fabrik A. G., Berlin, Germany.
412,848. **Sheet Material Embosser.** J. F. Coe, Watford, and E. C. March, Kenton.
412,863. **Milk Bottle Stopper.** C. E. Newell and J. G. Franklin & Sons, Ltd., both of London.
412,923. **Nonconducting Coverings for Sound.** W. J. B. Clark, London.
412,972. **Spring Upholstered Seat.** B. S. Davies and B. Wrigley, both of Woking.
413,041. **Fluid Actuated Valve.** A. R. Jahn, London.
413,044. **Slaughtering Appliance.** P. Cox, Bromley.
413,076. **Metallic Vapor Apparatus.** International General Electric Co., Inc., New York, N. Y., U. S. A., assignee of Allgemeine Elektricitäts-Ges., Berlin, Germany.
413,108. **Measured Liquid Deliverer.** Cie. Française De Manutention Des Liquides, Paris, France.
413,188. **Mangle.** J. G. Seldal, Gentofte, Denmark.
413,189. **Billiard Table.** Metal Billard Co., Ltd., Chur, Switzerland.
413,241. **Fountain Pen.** J. S. Jowitt, Lytham.
413,266. **Knitted Elastic Fabric.** G. C. Moore Co., Westerly, R. I., U. S. A.
413,271. **Telephone Cable.** Siemens & Halske A. G., Berlin, Germany.
413,295. **Cable.** Pirelli-General Cable Works, Ltd., London, and G. Bonetti, Southampton.
413,361. **Game of Chance.** E. J. Harper, Hawksworth.
413,376. **Circular Loom.** British Celanese, Ltd., and J. Jabouley, both of London.
413,399. **Hose Pipe.** Dunlop Rubber Co., Ltd., London, and H. Riding, Manchester.
413,415. **Golf Practicing Appliance.** E. F. Struckman, London.
413,438. **Chalk Holder.** G. H. Witcomb, Brighton.
413,449. **Elastic Fabric for Clothing.** United States Rubber Co., assignee of P. Adamson, both of New York, N. Y., U. S. A.
413,539. **Vacuum Cleaner.** Electrolux, Ltd., London, assignee of Inventia Patent-Verwertungs-Ges., Schaffhausen, Switzerland.
413,546. **Candy Wrapper.** M. Loesch, Dresden, Germany.
413,717. **Toy Vehicle.** A. R. Forner, Alicante, Spain.
413,760. **Flexible Bulb.** A. Allen, Birmingham.
413,764. **Stylographic Pen.** A. F. S. Kent, Iron Acton.
413,769. **Drum Clamping Device.** W. L. Newcombe, London.
413,780. **Inflatable Body Attachment.** A. Phillips, Timperley.
413,781. **Golf Practicing Appliance.** K. M. Lawson, Surbiton.
413,854. **Pneumatic Dispatch Carrier.** J. T. Needham, N. Plainfield, N. J., U. S. A.
414,017. **Bat and Ball Game.** L. Marx & Co., Ltd., Dudley. (L. Marx & Co., Inc., New York, N. Y., U. S. A.)
414,297. **Printing Machine.** Adrema Maschinenbauges., Berlin, Germany.

Germany

603,656. **Sole.** O. Mavaut, Woluwe St. Lambert, Belgium. Represented by E. Prinz, Berlin.
604,174. **Sole.** V. Schroppe, Berlin-Wilmersdorf.
604,183. **Rubber Motor for Toys.** R. Pfeiffer, Otterberg i.d. Rheinpfalz.
604,449. **Single Wheel Suspension for Vehicles.** Continental Gummi-Werke A.G., Hannover

TRADE MARKS

United States

317,348. **Tip Top Tex.** Liquid latex prophylactics. G. Aaronoff, New York, N. Y.
317,397. **Sepak.** Molded rubber receptacles to contain cigarettes, cosmetics, coins, jewelry, etc. R. J. Swanson, Chicago, Ill.
317,408. **Callipygian.** Corsets, girdles, brassières, and combinations of girdles and brassières. Kops Brothers, Inc., New York, N. Y.
317,409. **P-J.** Corsets, girdles, brassières, and combinations of girdles and brassières. Kops Brothers, Inc., New York, N. Y.
317,415. **Unilite.** Molded composition shoe heels. L. C. Gustin, Cambridge, Mass.
317,476. **Softie.** Foundation garments and girdles. Sears, Roebuck & Co., Chicago, Ill.
317,579. **Dunlopillo.** Rug pads. Dunlop Tire & Rubber Corp., Buffalo, N. Y.
317,592. **Paralastic.** Covered rubber thread. Para Thread Co., Inc., Woonsocket, R. I.
317,656. **Fulflex.** Rubber thread. Carr Mfg. Corp., Bristol, R. I.
317,693. Label containing the word: **"Darvan"** which is encircled by the words: **"R. T. Vanderbilt Co., N. Y. American Products."** Water solution of an organic chemical used to make water paste of dry powders for use in treating rubber latex. R. T. Vanderbilt Co., Inc., New York, N. Y.
317,703. **Pot Shot.** Toy missile. Jaymar Specialty Co., Brooklyn, N. Y.
317,707. **Prismatic.** Pneumatic tires. General Tire & Rubber Co., Akron, O.
317,719. **Biltmore.** Tires. Fisk Rubber Corp., Chicopee Falls, Mass.
317,733. **Dunlopillo.** Pads for operating, examining, and treatment tables. Dunlop Tire & Rubber Corp., Buffalo, N. Y.
317,913. **"Judy."** Dolls. Miller Rubber Co., Inc., Akron, O.
317,914. **"Baby Glee."** Dolls. Miller Rubber Co., Inc., Akron, O.
317,915. **"Milly."** Dolls. Miller Rubber Co., Inc., Akron, O.
317,919. **Lam-A-Fab.** Waterproof cement to prevent rug skidding. S. J. Russell Co., Peoria, Ill.
318,003. Label simulating an inverted pyramid containing the words: **"Vulcatex Top Dressing."** Automobile top dressing. D. O. Chase, doing business as Vulcatex Products Co., Glendale, Calif.
318,050. **Garex.** Preparation to soften unvulcanized rubber to assist in the dispersion of pigments and to aid in vulcanization. W. C. Hardesty Co., Inc., New York, N. Y.
318,109. **Sued-O-Lastic.** Corsets, corselets, girdles, brassières, and corset step-ins. Universal Brassiere & Just-rite Corset Co., Inc., New York, N. Y.
318,133. **Fan.** Brassières, corset brassières, and girdles. Model Brassiere Co., Inc., Brooklyn, N. Y.
318,249. **Eversharp.** Pencil erasers, etc. Wahl Co., Wilmington, Del.

Obituary

(*Continued from page* 54)

Akron, but at the company's plants in California, Canada, Argentina, and Spain. For 12 years he was also chairman of the Firestone Suggestion Board.

The deceased was born in 1882 in Denmark and attended the University of Copenhagen.

He leaves his widow, a son, and a daughter.

ADVERTISING PAGES REMOVED

Market Reviews

CRUDE RUBBER

Commodity Exchange

TABULATED WEEK-END CLOSING PRICES

Futures	Sept. 29	Oct. 27	Nov. 3	Nov. 10	Nov. 17	Nov. 24
Oct.	14.82	13.78	....	....	....	....
Nov.	14.93	13.85	12.90	13.30	12.84	12.89
Dec.	15.04	13.93	12.97	13.40	12.92	12.96
Jan.	15.17	14.06	13.08	13.49	13.01	13.06
Feb.	....	14.18	13.20	13.61	13.10	13.18
Mar.	15.42	14.33	13.34	13.75	13.21	13.30
May	15.64	14.52	13.58	13.90	13.41	13.50
July	15.89	14.72	13.75	14.12	13.61	13.70
Sept.	....	14.93	14.00	14.33	13.81	13.90
Oct.	....	....	....	14.10	14.43	13.91	14.00
Volume for week (tons)	....	....	11,040	30,260	13,510	14,050	25,560

THE above table gives the nearest first and last week-end closing prices of the month previous to that under review, also the week-end closing prices each week of the period under review. This plan permits tracing at a glance the trend of prices on each future for approximately 2 consecutive months.

The marked recession of 102 to 111 points during September continued through October, thus registering a further decline of 99 to 117 points. Continued uncertainty of economic conditions, weak and fluctuating sterling and commodities, and rumor bewilderment as to the application and possible outcome of conditions attending the restriction plan were the major factors responsible for the continued downward trend.

Week ended November 3. World rubber stocks at the end of September, 1934, were reported to be approximately 69,000 tons greater than a year ago, and this in spite of restriction. This information led to speculation that the International Regulation Committee would decide in its meeting, October 30, to reduce 1935 quotas 30% to 40%. The week opened, therefore, with Monday closing 4 to 19 points above Saturday's close. Rumors that the Dutch would resist anything beyond the existing 12½% quota reduction because of the inevitable difficulty of controlling native exports, and the announcement that the decision of the Restriction Regulating Committee would not be released here until 8 p.m. caused a bearish attitude and speculative selling that sent Tuesday's prices down 18 to 22 points. The break became violent Wednesday, 89 to 94 points, on news that the Committee had adjourned in disagreement. Selling volume for the day amounted to 12,290 tons, the largest trading since May 14. A reaction occurred November 1 and 2 despite lower London prices and the continued disagreement of the Regulation Committee. Apparently Wednesday's break had sent prices below justification; therefore speculative buying and sharply increasing tire prices introduced a bullish tone. An Amsterdam message by Reuters attributed the disagreement to British demand of 40% reduction for the first 6 months of 1935 while the Dutch insisted on not more than 20% for 3 months. The hectic week closed in a bearish mood. A Reuters cable stated that the Committee, in an unexpected meeting Friday, had agreed on a 75% reduction from quota for the first quarter of 1935. This news apparently was disappointing to outside interests. The previous 2 days' gains were practically erased, and the week ended with a net loss of 88 to 100 points.

Week ended November 10. Fluctuations during this period were within relatively narrow limits with the trend upward. Net gains of 33 to 41 points were experienced. Selling on outcome of restriction decision had subsided, stronger London prices, the defeat of anti-inflationists in domestic election giving rise to inflation expectations, improvement within the rubber industry, and firm to strong commodity prices accounted for the mildly bullish tendency.

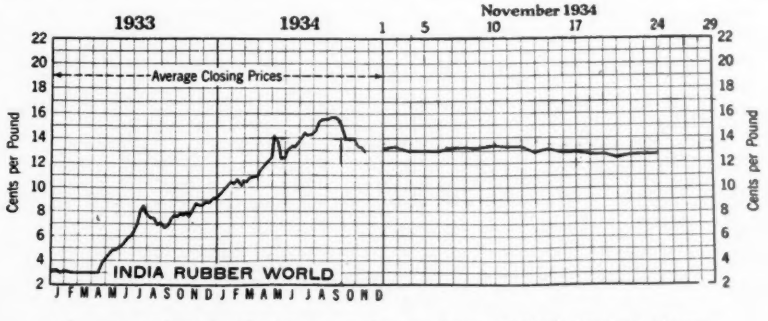
Week ended November 17. The previous week's gains were more than offset by the 47- to 53-point recession during this uninteresting period. The Armistice holiday produced the rumor that British manufacturers favored the liberal export quotas since they look forward to increased production next year for export to China. Likewise the American manufacturers were reputed to look favorably to the quotas as set as they expect substantially increased tire schedules next year for car manufacturers and replacement. Despite such favorable news the week started below the previous close. This weakness led to long liquidation and another sharp break, which later partially recovered only to dip again as the period closed. Contributing causes seemed to be weakness in sterling and London markets and news that the Dutch were offering heavy tonnages to the market, also that export duties on native rubber were to remain at 20 florins per 100 kilos.

Week ended November 24. Weak and erratic London markets, cheap offerings from the East, and speculative selling apparently sympathetic with bearish commodities served to start the period from 13 to 21 points down. This trend continued during the first half of the week, with speculative interests shifting from near-by to later futures on the theory that the liberal first quarter export quotas would be found inadequate. An upturn characterized the later half of the period, which ended at prices showing a net gain of from 4 to 9 points. British denial of the rumor that the Dutch had proposed termination of restriction, and heavier outside demand were factors responsible for the favorable turn.

New York Outside Market

Spot rubber prices, like futures, continue the habit of trending downwardly. During October, the net decline amounted to 1 1/8¢; while November was ushered in just 1/8¢ above the lowest point since early in June. The trend is obvious from the following week-end closing prices: September 29, 14 1/8¢; October 27, 13 7/8¢; November 3, 13¢; November 10, 13 1/8¢; November 17, 12 [illegible]¢; and November 24, 13¢.

Week ended November 3. The beginning was closely in line with the previous week's close, but demand was slight, apparently out of the desire of buyers to await the outcome of the International Rubber Regulation Committee decision regarding 1935 restriction quotas. Prices, consequently, lost ground slightly during the first 2 days. News of Committee disagreement lowered the price to 13¢ on October 31.



New York Outside Market—Spot Closing Prices Ribbed Smoked Sheets

Demand at this price and following the lead of futures brought a short-lived rise, which ended with news of the liberal restriction agreement, sending the price back to 13¢ at the close of the period.

Week ended November 10. Prices were relatively steady, and fluctuations small after the election holiday owing to expectation of inflation, fairly strong commodity prices, and clarification of the tire-price increase situation between tire manufacturers and mail order houses.

Week ended November 17. Almost complete lack of demand, even with reduced price offerings, brought about a weak and sagging market. Evidence of some factory buying caused a slight strengthening November 15, but a reaction of the futures market due to speculative selling and reports of large foreign offerings had a sympathetic effect on the outside market, which dropped below the 13¢ level where the period closed at 12⅞¢.

Week ended November 24. Weak cables, cheaper offerings from the East, and a minimum of factory demand depressed prices to a new low of 12.5¢ by mid-week. Favorable restriction news, strengthening future activity, and a return of factory demand reversed the trend with a rise to 13¢.

New York Quotations

New York outside market rubber quotations in cents per pound

Plantations	Nov. 25, 1933	Oct. 26, 1934	Nov. 26, 1934
Rubber latex, normal ..... *gal.*	72	54 /55½	54
Sheet			
Ribbed smoked, spot	9 /9¼	14 /14⅛	12⅝/12¾
Nov.-Dec.	9 /9¼	14⅛/14⅜	12⅝/12¾
Jan.-Mar.	9⅜/9½	14⅜/14½	12⅞/13
Apr.-June	9¾/9⅞	14¾/14⅞	13¼/13⅜
Crepe			
No. 1 thin latex, spot 10	/10¼	14⅞/15⅛	13⅜/13½
Nov-Dec. 10	/10½	14⅜/15¼	13⅜/13½
Jan.-Mar. 10¼	/10½	15⅛/15½	13⅝/14¼
Apr.-June 10½	/10¾	15½/15⅞	14 /15
No. 3 Amber, spot.	6¾/ 6½	11½	10¾/11
No. 1 Brown....	6¼/ 6⅜	11⅝/11¾	11 /11⅛
Brown rolled ...	5⅛/ 5¼	9⅜/ 9½	9⅜/ 9⅝
Paras			
Upriver fine	9	10¼	9½
Upriver fine	*12½	*13¾	*12¾
Upriver coarse ...	8½	7¾	7
Upriver coarse ...	*12	*11	*11
Islands fine	..	10½	9¼
Islands fine	*12½	*13¾	*12¾
Acre, Bolivian fine	9¼	10½	9¾
Acre, Bolivian fine	*11¾	*14	*13
Beni, Bolivian ...	9¼	10½	9¾
Madeira fine	9	10¼	9½
Caucho			
Upper ball	..	7½	7
Upper ball	..	*11	*11
Lower ball	..	7	6¾
Pontianak			
Bandjermasin ...	6	6	6
Pressed block ...	12	10½	10¼
Sarawak	6	6	6
Manicobas			
Manicoba, 30% guar.	†4½	..	..
Mangabiera, thin sheet	..	..	..
Guayule			
Duro, washed and dried	12	12	12
Ampar	13	13	13
Africans			
Rio Nuñez	14	12	12
Black Kassai	12	10	10
Prime Niger flake.	20	25	25
Gutta Percha			
Gutta Siak	12	9¼	9
Gutta Soh	17	14	14
Red Macassar ...	1.30	1.40	1.50
Balata			
Block, Ciudad Bolivar	32	42	40
Manaos block	32	32	30
Surinam sheets ...	40	42	40
Amber	45	45	42

*Washed and dried crepe. Shipments from Brazil. †Nominal.

Eastern and Southern

(*Continued from page 56*)

der the rainwear division of the rubber manufacturing industry, the National Industrial Recovery Board has ruled in reply to a request from the Rainwear Divisional Code Authority of the rubber manufacturing industry.

The applicant authority cited the popularity of the suedine garments and declared that the rainwear division of the rubber manufacturing industry provides a higher minimum wage rate than that of the cotton garment industry, which industry, it was said, never manufactured the garments until a year or 2 ago.

United States Latex Imports

Year	Pounds	Value
1931	10,414,712	$884,355
1932	11,388,156	601,999
1933	24,829,861	1,833,671
1934		
Jan.	2,521,961	$239,054
Feb.	1,983,210	193,732
Mar.	2,539,425	257,545
Apr.	2,988,131	321,390
May	3,151,740	368,642
June	3,266,318	421,317
July	2,757,167	385,733
Aug.	2,617,829	369,335
Sept.	2,097,385	312,967

Data from United States Department of Commerce, Washington, D. C.

Record World Stocks

World crude rubber stocks September 30 were 684,971 tons, the largest on record, showing increases of 9,017 tons in the month and 68,661 in 12 months. Manufacturers' and dealers' stocks declined 2,980 tons to 359,667 September 30, but then were 25,030 tons larger than a year before.

Tire Production Statistics

	Pneumatic Casings—All Types: Inventory	Production	Total Shipments
1932	6,115,487	32,067,732	32,200,820
1933	7,110,456	36,243,384	35,274,970
1934			
Jan.	9,393,857	3,803,939	3,125,726
Feb.	10,403,282	4,205,039	3,186,363
Mar.	11,301,142	5,024,718	4,096,273
Apr.	11,621,310	4,626,881	4,305,227
May	10,792,770	4,322,536	5,171,748
June	9,912,780	4,211,905	5,071,403
July	9,153,712	3,252,251	4,032,689
Aug.	8,436,236	3,426,652	4,179,022
Sept.	8,166,339	2,847,879	3,087,416
	Solid and Cushion Tires		
1932	23,830	97,089	108,581
1933	.....	130,987	126,990
1934			
Jan.	29,971	13,792	13,946
Feb.	.....	12,440	12,797
Mar.	28,280	15,017	15,273
Apr.	.....	16,217	13,701
May	.....	18,639	17,551
June	.....	21,385	19,487
July	.....	18,283	17,807
Aug.	.....	17,864	16,283
Sept.	.....	14,676	13,275
	Inner Tubes—All Types		
1932	5,399,551	29,513,246	30,328,536
1933	6,251,941	34,044,689	33,112,472
1934			
Jan.	8,150,708	3,444,574	3,102,931
Feb.	8,892,154	3,956,082	3,223,591
Mar.	9,936,574	5,038,649	3,994,683
Apr.	10,267,331	4,593,370	4,212,020
May	9,741,304	4,228,239	4,754,683
June	8,531,574	3,974,408	5,149,951
July	7,811,828	3,425,352	4,193,210
Aug.	7,328,404	3,569,626	4,072,352
Sept.	7,409,888	3,016,845	2,933,743

	Cotton and Rubber Consumption Casings, Tubes, Solid and Cushion Tires: Cotton Fabric Pounds	Crude Rubber Pounds	Consumption of Motor Gasoline (100%) Gallons
1932...	128,981,222	416,577,533	15,703,800,000
1933...	148,989,293	512,489,423	15,880,746,000
1934			
Jan. ..	16,437,210	59,957,163	1,239,798,000
Feb. ..	18,720,923	63,400,171	1,047,816,000
Mar. ..	20,927,389	75,636,859	1,298,472,000
Apr. ..	19,371,041	69,930,591	1,374,870,000
May ..	18,785,428	67,636,897	1,601,922,000
June ..	17,715,577	61,849,622	1,524,432,000
July ..	13,267,392	49,352,977	1,583,190,000
Aug. ..	13,724,148	50,419,339	1,635,186,000
Sept. ..	12,942,100	44,496,192	1,469,328,000

Rubber Manufacturers Association, Inc., figures representing approximately 97% of the industry for 1934 and 80% for previous years, with the exception of gasoline consumption

New York Outside Market—Spot Closing Rubber Prices—Cents per Pound

	October, 1934									November, 1934												
	22	23	24	25	26	27	29	30	31	1	2	3	5	6*	7	8	9	10	12*	13	14	15	16	17
No. 1 Ribbed Smoked Sheet	14	14	14⅛	13⅞	13⅞	13⅞	13⅛	13½	13	13⅛	13⅜	13	13	..	13⅜	13¼	13¼	13⅛	..	13¼	12⅞	13⅛	12⅞	12⅞
No. 2 Ribbed Smoked Sheet	13⅜	13⅜	13⅜	13¼	13⅛	13¼	13¼	12⅛	12⅜	12½	12¾	12⅜	12⅜	..	12¾	12⅝	12⅝	12⅛	..	12⅝	12¼	12⅜	12¼	12¼
No. 3 Ribbed Smoked Sheet	13⅛	13⅛	13⅛	13	12⅞	13	13	12⅛	12⅛	12⅜	12½	12⅛	12⅛	..	12½	12⅜	12⅜	12⅛	..	12⅜	12	12⅛	12	12
No. 4 Ribbed Smoked Sheet	13	13	13	12⅞	12¾	12⅞	12⅞	12	12	12¼	12⅜	12	12	..	12⅜	12¼	12¼	12⅛	..	12¼	11⅞	12	11⅞	11⅞
No. 1 Thin Latex Crepe...	14⅞	14⅞	15	14¾	14¾	14¾	14⅞	14⅝	13¾	14	14¼	13⅞	13⅞	..	14¼	14⅛	14⅛	14⅛	..	14⅛	13¾	14	13¾	13¾
No. 1 Thick Latex Crepe ..	14¾	14¾	14⅞	14⅝	14⅝	14⅝	14¾	14½	13⅝	13⅞	14⅛	13¾	13¾	..	14⅛	14	13⅞	13⅜	..	13⅞	13½	13¾	13½	13½
No. 1 Brown Crepe.....	11½	11¾	11⅝	11½	11½	11⅝	11⅝	11⅜	10⅝	11	11⅜	11	11	..	11⅜	11⅜	11⅛	11½	..	11½	11	11¼	11	11
No. 2 Brown Crepe.....	11⅜	11½	11½	11⅜	11¼	11⅜	11⅜	11⅛	10¾	10¾	11⅛	10¾	10¾	..	11⅛	11⅛	11⅛	11¼	..	11¼	10¾	11	10¾	10¾
No. 2 Amber	11½	11¾	11⅝	11½	11½	11⅝	11⅝	11⅜	10⅝	11	11⅜	11	11	..	11⅜	11⅜	11⅛	11½	..	11½	11	11¼	11	11
No. 3 Amber	11⅜	11½	11½	11⅜	11¼	11⅜	11⅜	11⅛	10¾	10¾	11⅛	10¾	10¾	..	11⅛	11⅛	11⅛	11¼	..	11¼	10¾	11	10¾	10¾
No. 4 Amber	10¾	11	11	10⅞	10¾	10⅞	10⅞	10⅝	9⅞	10¼	10⅝	10¼	10¼	..	10⅝	10⅝	10⅜	10⅝	..	10¾	10¼	10½	10¼	10¼
Rolled Brown	9½	9½	9½	9⅜	9⅜	9½	9⅜	9⅛	8⅞	9¼	9⅝	9⅛	9⅛	..	9⅜	9⅜	9⅜	9½	..	9½	9⅛	9¼	9⅛	9⅛

* Holiday.

British Malaya

An official cable from Singapore to the Malayan Information Agency, Malaya House, 57 Charing Cross, London, S.W.1, England, gives the following figures for October, 1934:

Rubber Exports: Ocean shipments from Singapore, Penang, Malacca, and Port Swettenham

To	October, 1934 Sheet and Crepe Rubber Tons	October, 1934 Latex, Concentrated Latex, Revertex, and Other Forms of Latex Tons
United Kingdom	11,662	555
United States	19,604	420
Continent of Europe	7,710	281
British possessions	1,216	52
Japan	4,787	11
Other countries	742	5
Totals	45,721	1,324

Rubber Imports: Actual, by Land and Sea

From	October, 1934 Dry Rubber Tons	October, 1934 Wet Rubber Tons
Sumatra	1,195	3,193
Dutch Borneo	605	1,351
Java and other Dutch Islands	138	15
Sarawak	1,412	..
British Borneo	589	20
Burma	96	..
Siam	899	429
French Indo-China	102	36
Other countries	128	18
Totals	5,164	5,062

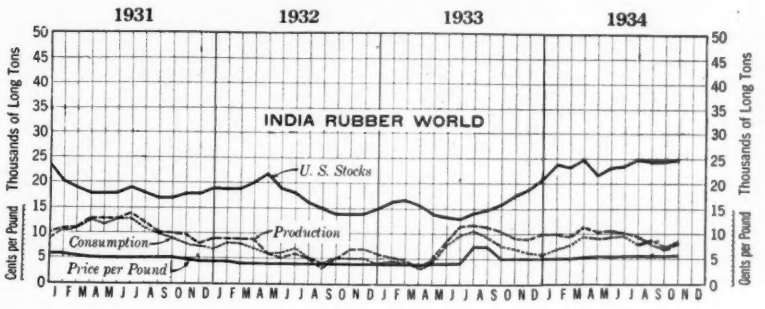
World Rubber Absorption—Net Imports

Consumption	Long Tons—1934 July	Aug.	Sept.
United States	33,747	34,058	30,693
United Kingdom	6,010	14,427	3,492
Net Imports			
Australia	732	658	743
Austria	160	172	...
Belgium	810	669	...
Canada	2,430	1,948	2,770
Czechoslovakia	1,094	1,495	477
Denmark	146	266	232
Finland	277	226	197
France	4,051	3,774	4,633
Germany	5,494	3,078	2,607
Italy	708	1,795	...
Japan	5,739	4,945	...
Netherlands	540	239	339
Norway	82	68	89
Russia	1,640	...	...
Spain	747	277	...
Sweden	1,077	473	462
Switzerland	104	162	89
Others	*2,250	*2,250	*2,250
Totals	67,838	...	...
Minus U. S. (Cons.)	33,747	34,058	30,693
Total Foreign	34,091	...	...

*Estimate to complete table.

Compiled by Leather-Rubber-Shoe Division, Department of Commerce, Washington, D. C.

RECLAIMED RUBBER


1931
1932
1933
1934
INDIA RUBBER WORLD
Thousands of Long Tons
Cents per Pound
U. S. Stocks
Consumption
Production
Price per Pound
J F M A M J J A S O N D J F M A M J J A S O N D J F M A M J J A S O N D J F M A M J J A S O N D

Production, Consumption, Stocks, and Price of Tire Reclaim

United States Reclaimed Rubber Statistics—Long Tons

Year	Production	Consumption	Consumption Per Cent to Crude	United States Stocks*	Exports
1931	132,462	125,001	35.7	19,257	6,971
1932	75,656	77,500	23.3	21,714	3,536
1933	99,974	81,612	20.1	20,746	3,583
1934					
January	9,828	7,000	17.3	24,303	333
February	9,504	7,646	18.8	23,356	282
March	11,479	9,683	20.3	25,113	354
April	10,185	9,387	20.9	22,033	394
May	10,848	9,500	22.1	22,887	559
June	10,820	9,459	23.5	23,664	444
July	9,446	8,175	25.0	24,926	669
August	8,160	8,493	25.5	24,607	410
September	6,974	7,024	23.1	24,540	307
October	8,145	8,171	26.1	24,511	356

*Stocks on hand the last of the month or year.

Compiled by The Rubber Manufacturers Association, Inc.

THE opinion is general in rubber manufacturing circles that the outlook for the industry is quite encouraging, based on the expectancy that a greater new car demand will follow the January showing of 1935 models. Prices of reclaims are at very fair levels considering their value. Manufacturers are placing orders for 1935 deliveries. Reclaim production is generally quite active; that in October was about 1,200 tons greater than in September. The consumption ratio of reclaim to crude also advanced sharply in October.

Quotations are firm, steady, and unchanged from last month.

New York Quotations

November 26, 1934

	Spec. Grav.	Cents per lb.
High Tensile		
Super-reclaim, black	1.20	8¾/9
red	1.20	7 /7¼
Auto Tire		
Black	1.21	5 /5¼
Black selected tires	1.18	5¼/5½
Dark gray	1.35	6¼/6½
White	1.40	9¼/9½
Shoe		
Unwashed	1.60	6½/6¾
Washed	1.50	8 /9
Tube		
No. 1	1.00	13 /
No. 2	1.10	7½/7¾
Truck Tire		
Truck tire, heavy gravity	1.55	5½/6
Truck tire, light gravity	1.40	6 /6¼
Miscellaneous		
Mechanical blends	1.60	4¼/4½

"Day Ro-Ball Stabilized Gyrating Screen." The J. H. Day Co., Cincinnati, O. This 8-page illustrated circular is devoted mostly to the description and merits of the distinctive features of the Ro-Ball screen. It is supplemented with illustrations of the Day auxiliary line of processing equipment including cement mixers for laboratory and factory use.

New York Outside Market (Continued)

	November, 1934 19	20	21	22	23	24
No. 1 Ribbed Smoked Sheet	12¾	12¾	12 1/16	12 11/16	12 5/8	13
No. 2 Ribbed Smoked Sheet	12¼	12¼	11 7/8	12 1/16	12	12 3/8
No. 3 Ribbed Smoked Sheet	12	12	11 5/8	11 15/16	11 7/8	12 1/8
No. 4 Ribbed Smoked Sheet	11 7/8	11 7/8	11½	11 13/16	11¾	12
No. 1 Thin Latex Crepe	13 5/8	13 5/8	13 3/8	13½	13 3/8	13¾
No. 1 Thick Latex Crepe	13 3/8	13 3/8	13¼	13 3/8	13¼	13 5/8
No. 1 Brown Crepe	10 7/8	10 7/8	10 7/8	11	10 7/8	11¼
No. 2 Brown Crepe	10 5/8	10 5/8	10 5/8	10¾	10 5/8	11
No. 2 Amber	10 7/8	10 7/8	10 7/8	11	10 7/8	11¼
No. 3 Amber	10 5/8	10 5/8	10 5/8	10¾	10 5/8	11
No. 4 Amber	10 1/8	10 1/8	10 1/8	10¼	10 1/8	10½
Rolled Brown	9¼	9¼	9¼	9 3/8	9 3/8	9 5/8

Low and High New York Spot Prices

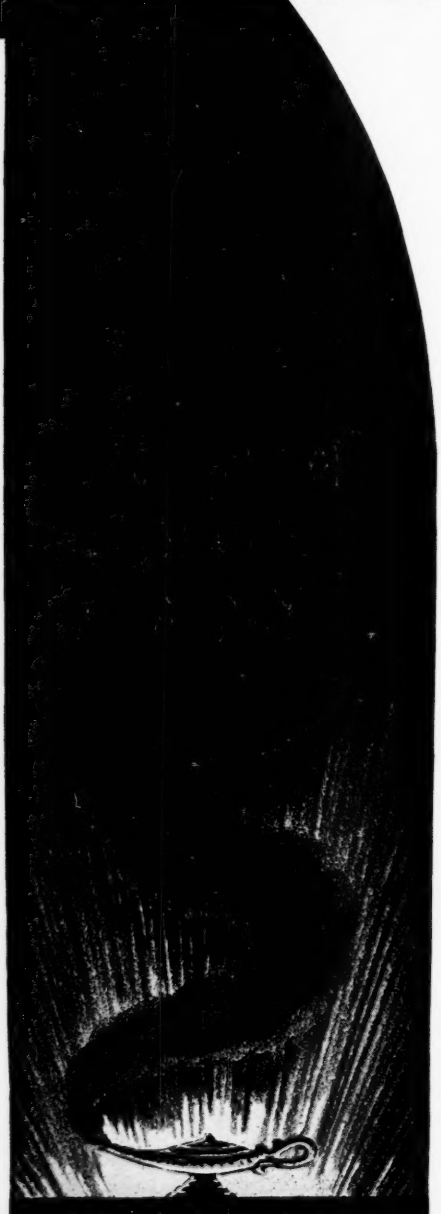
Plantations	November 1934*	November 1933	November 1932
Thin latex crepe, No. 1	13 3/8/14¼	8½/10½	3 7/8/4 1/8
Smoked sheet, No. 1 ribbed	12 5/16/13 3/8	7¾/ 9⅛	3 5/16/3 7/16
Paras			
Upriver fine	9¾/10	8 / 9	7¼/7½

*Figured to November 26, 1934. All prices in cents per pound.

MICRONEX

Whether In Compressed Form Or As Micronex Beads* It Ever Remains The Master Colloid

*The ORIGINAL Pellet Black
Protected by Basic Product Patents



*The Magic Lamp
Your Protection
for Over 50 Years*

BINNEY & SMITH Co.

Specialists in CARBON BLACKS, STEARIC ACID, IRON OXIDES, MINERAL RUBBER *and other products for the* RUBBER INDUSTRY

41 E. 42nd St., New York

COMPOUNDING INGREDIENTS

DURING November the purchase of compounding materials in general was routine and very much on the hand-to-mouth order. There are no present indications that prices of rubber chemicals or reclaims will advance early in the new year. Increases are probable, however, for the general run of compounding powders such as barytes, whiting, clays, etc.

ACCELERATORS. Prices for 1935 on accelerators and antioxidants will be unchanged as the new year comes in.

BY-PRODUCT WHITING. There has been no recent increase in the price of by-product whiting, but probably it will be higher next year because of increased production cost due to advances in raw materials and labor.

CARBON BLACK. Sales of carbon black during the first half of 1934 were very satisfactory. One important producer reports 1934 total sales somewhat greater than those of 1933. Export business has improved decidedly.

Kosmobile is a new free-flowing, non-flying, dustless carbon black.

LITHARGE. Consumer demand is routine and moderate. Two minor price reductions occurred on carload lots early in November. Five-ton lots and less were unchanged.

LITHOPONE. Demand continues slow and spotty. Prices are steady and unchanged. Contracts for 1935 are sought at 1934 prices.

SOFTENERS AND PLASTICIZERS. Because of their value as aids to mixing and processing generally these materials are accepted by the rubber industry as practically indispensable on the score of economy in time and power.

TITANIUM PIGMENTS. Rubber trade interest is steady. The industrial demand for these pigments continues to exceed production. Next year contracts are being taken at 1934 prices.

V. M. AND P. NAPHTHA. This common solvent is strongly entrenched in the rubber industry by reason of its price. Hydrogenated naphtha in 4 different fractions is being introduced, characterized by special technical qualities of importance in cement making for dipping and proofing.

ZINC OXIDE. The price of zinc oxide has remained unchanged since last April, when an advance took place restoring partly previous price reductions. The indications are that the present level of prices will probably continue during the remainder of this year and for several months into 1935.

New York Quotations

November 26, 1934

Prices Not Reported Will Be Supplied on Application

Abrasives		
Pumicestone, powdered	lb.	$0.01¾/$0.03½
Rottenstone, domestic	lb.	.02½/ .05
English	ton	
Silica, 15	ton	
Tripoli	lb.	.02¼/ .03
Accelerators, Inorganic		
Lead, white, dry (bbls.)	lb.	.06½
Lime, hydrated	ton	20.00
Litharge (commercial)	lb.	.06
Magnesia, calcined, heavy	lb.	.04
carbonate	lb.	.06½/ .07
Accelerators, Organic		
A-1	lb.	.21 / .25
A-5-10	lb.	.33 / .36
A-7	lb.	.53 / .65
A-10	lb.	
A-11	lb.	.60 / .75
A-16	lb.	.55 / .65
A-19	lb.	.56 / .75
A-32	lb.	.70 / .80
A-77	lb.	
Accelerator 49	lb.	.40 / .52
552	lb.	
808	lb.	
833	lb.	
Acrin	lb.	
Aldehyde ammonia	lb.	
Altax	lb.	
Barak	lb.	
Beutene	lb.	
Butyl Zimate	lb.	
C.P.B.	lb.	
Captax	lb.	
Crylene	lb.	
D.B.A.	lb.	
D.B.X.	lb.	
Di-Esterex	lb.	
Di-Esterex-N	lb.	
DOTG	lb.	.44 / .57
D.O.T.T.U.	lb.	
DPG	lb.	.35 / .47
Esterex	lb.	
Ethylideneaniline	lb.	
Formaldehyde P.A.C.	lb.	
Formaldehydeaniline	lb.	
Formaldehyde-para-toluidine	lb.	
Guantal	lb.	.42 / .51
Hepteen Base	lb.	
Hexamethylenetetramine	lb.	
Lead oleate, No. 999	lb.	.10
Witco	lb.	.11
Lithex	lb.	
Methylenedianilide	lb.	
Monex	lb.	
Novex	lb.	
Pipsolene	lb.	
Plastone	lb.	
R-2	lb.	1.55 / 1.90
base	lb.	4.55 / 5.00
R & H 50-D	lb.	
Safex	lb.	
Super-sulphur No. 1	lb.	
No. 2	lb.	
Tepidone	lb.	
Tetrone A	lb.	
Thio	lb.	
Thiocarbanilide	lb.	
Thionex	lb.	
Trimene Base	lb.	
Triphenyl guanidine (TPG)	lb.	
Tuads	lb.	
Ureka	lb.	$0.62 /$1.00
Blend B.	lb.	
C	lb.	.58 / .69
Vulcanex	lb.	
Vulcanol	lb.	
Vulcone	lb.	
Z.B.X.	lb.	
Z-88-P	lb.	.48 / .60
Zimate	lb.	
Acids		
Acetic 28% (bbls.)	100 lbs.	2.40 / 2.65
glacial (carboys)	100 lbs.	14.00
Sulphuric, 66°	ton	15.50
Age Resisters		
Age-Rite Gel	lb.	
HP	lb.	
powder	lb.	
resin	lb.	
white	lb.	
Akroflex	lb.	
Albasan	lb.	
Antox	lb.	
B.L.E.	lb.	
Flectol A	lb.	
B	lb.	
H	lb.	
White	lb.	
Hiflex A	lb.	
C	lb.	
M.U.F.	lb.	
Neozone (standard)	lb.	
A	lb.	
B	lb.	
C	lb.	
D	lb.	
E	lb.	
L	lb.	
Oxynone	lb.	
Parazone	lb.	
Permalux	lb.	
Solux	lb.	
V.G.B.	lb.	
Zalba	lb.	
Alkalies		
Caustic soda, 50% liquid, Columbia	100 lbs.	2.25
solid	100 lbs.	2.50 / 3.50
Antiscorch Materials		
Antiscorch T	lb.	
Retarder B	lb.	
W	lb.	
R. H. Cumar	lb.	.075 / .085
U.T.B.	lb.	
Antisun Materials		
Heliozone	lb.	
Sunproof	lb.	
Binders, Fibrous		
Asbestos	ton	$30.00
Brake Lining Saturants		
B. R. C. No. 553	lb.	.015 /$0.017
B. R. T. No. 3	lb.	.015 / .017
Colors		
BLACK		
Bone (Quality Group No. 1)	lb.	.11½/ .12
Lampblack (commercial)	lb.	.07 / .12
BLUE		
Brilliant	lb.	
Prussian	lb.	.35½
Toners	lb.	.80 / 3.50
Ultramarine, dry	lb.	.10
BROWN		
Mapico	lb.	.13
Sienna, Italian, raw (Quality Group No. 1)	lb.	.12½
GREEN		
Brilliant	lb.	
Chrome, light	lb.	.20
medium	lb.	.20
oxide (delivered)	lb.	.21½
Dark	lb.	
Guignet's	lb.	.70
Light	lb.	
Toners	lb.	.85 / 3.50
ORANGE		
Lake	lb.	
Toners	lb.	.40 / 1.60
ORCHID		
Toners	lb.	1.50 / 2.00
PINK		
Toners	lb.	1.50 / 4.00
PURPLE		
Permanent	lb.	
Toners	lb.	.60 / 2.00
RED		
Antimony Crimson, R. M. P. No. 3	lb.	.46
Sulphur free	lb.	.48 / .50
Golden 15/17%	lb.	.23
7-A	lb.	.33
Z-2	lb.	.20
Cadmium	lb.	.75 / .80
Chinese	lb.	
Crimson	lb.	
Iron Oxides Rub-Er-Red	lb.	.09¼
Mapico	lb.	.09¼
Medium	lb.	
Scarlet	lb.	
Toners	lb.	.80 / 2.00
WHITE		
Lithopone (bags)	lb.	.04½/ .04¾
Albalith Black Label-11	lb	.04½/ .04¾

Astrolith (5-ton lots)	lb.	$0.04½/$0.04¾
Azolith	lb.	.04½/ .04¾
Cryptone-19	lb.	.06 / .06¼
CB-21	lb.	.06 / .06¼
Sunolith (5-ton lots)	lb.	.04½/ .04¾
XX-20 Zinc Sulphide	lb.	.10½/ .10¾
86	lb.	.10½/ .10¾
Rayox	lb.	
Titanolith (5-ton lots)	lb.	.06 / .06¼
Titanox-A	lb.	.17 / .18¾
B	lb.	.06 / .06½
C	lb.	.06 / .06½
Ti-Tone	lb.	
Zinc Oxide		
Azo 35 (35% leaded)	lb.	.05¾/ .06
Z (10% leaded)	lb.	.06¼/ .06½
ZZ (3-5% leaded)	lb.	.06¼/ .06½
ZZZ (lead free)	lb.	.06½/ .06¾
Ceramatone	lb.	.06½/ .06¾
F. P. Florence, Green Seal-8	lb.	.09⅜/ .09⅝
Red Seal-9	lb.	.08⅜/ .08⅝
White Seal-7 (bbls.)	lb.	.10⅝
Green Seal, Anaconda	lb.	.09⅜/ .09⅝
Horsehead (lead free) brand		
Special-3	lb.	.06½/ .06¾
XX Red-4	lb.	.06½/ .06¾
72	lb.	.06½/ .06¾
78	lb.	.06½/ .06¾
103	lb.	.06½/ .06¾
Kadox Black Label-15	lb.	.09⅜/ .09⅝
Blue Label-16	lb.	.08⅜/ .08⅝
Red Label-17	lb.	.07 / .07¼
Lead free, all grades, Anaconda	lb.	.06½/ .06¾
Leaded, 5%, Anaconda	lb.	.06¼/ .06½
35%, Anaconda	lb.	.05¾/ .06
Red Seal, Anaconda	lb.	.08⅜/ .08⅝
St. Joe (lead free)		
Black Label	lb.	.06½
Green Label	lb.	.06½
Red Label	lb.	.06½
U.S.P. (bbls.)	lb.	.12¾
U.S.P. X (bbls.)	lb.	.12½
White seal, Anaconda	lb.	.10⅝
YELLOW		
Cadmium	lb.	.40 / .45
Lemon	lb.	
Mapico	lb.	.09½
Ocher, domestic (Quality Group A)	lb.	.02¾
Toners	lb.	2.50

Dispersing Agents

Bardex	lb.	.023 / .025
Bardol	lb.	.021 / .023
Darvan	lb.	
Sperzo	lb.	

Factice—See Rubber Substitutes

Fillers, Inert

Asbestine, c.l., f.o.b. mills	ton	15.00
Barytes, c.l.	ton	22.20
f.o.b. St. Louis	ton	23.00
off color, domestic	ton	22.50 /25.00
white, imported	ton	32.50 /35.00
Blanc fixe, dry precip	ton	70.00 /75.00
pulp	ton	42.50
Calcene	ton	35.00 /43.00
Infusorial earth	lb.	.03 / .05
Kalite No. 1	ton	
No. 3	ton	
Suprex, white, extra light	ton	
heavy	ton	45.00 /60.00
Whiting		
Chalk precipitated	lb.	.04¼/ .04¾
Columbia brand	ton	8.00 /13.00
Domestic	ton	
Hakuenka	lb.	
Paris white, English cliff-stone	100 lbs.	
Sussex	ton	
Witco	ton	15.00
Wood flour (f.o.b. New Hampshire)	ton	

Fillers for Pliability

Flex	lb.	
Fumonex, c.l., f.o.b works, bags	lb.	.03
l.c.l., f.o.b. warehouse	lb.	.05¼/ .07
P-33	lb.	
Thermax	lb.	
Velvetex	lb.	

Finishes

IVCO lacquer, clear	gal.	
colors	gal.	
Rubber lacquer, clear	gal.	
Colored	gal.	
No. 106	gal.	3.00
Starch, corn, pwd	100 lbs.	3.46 / 3.66
potato	lb.	.05¼/ .06
Talc, dusting	ton	20.00
Pyrax	ton	

Flock

Cotton flock, dark	lb.	.10½/ .13
dyed	lb.	.50 / .85
white	lb.	.14 / .20
Rayon flock, colored	lb.	1.60 / 1.75
white	lb.	1.40

Latex Compounding Ingredients

Aquarex A	lb.	
D	lb.	
F	lb.	
Aresco	lb.	$0.28 /$0.40
Aresklene	lb.	
Butyl Zimate	lb.	
Casein, domestic (5-ton lots, delivered)	lb.	.09¾/ .10¼
Catalpo	ton	
Colloidal sulphur	lb.	
zinc oxide	lb.	
Dispersaid	lb.	1.50
Dispersed Antox	lb.	
color pastes	lb.	
factice compound	lb.	.36
Heliozone	lb.	
Emo, brown	lb.	.12
white	lb.	.12
Igepon A	lb.	
Latex disinfectant No. 2	lb.	
Nekal BX (dry)	lb.	
Palmol	lb.	.10
Vulcan colors	lb.	

Mineral Rubber

B. R. C. No. 20	lb.	.014 / .016
Black Diamond	ton	27.00
Genasco Hydrocarbon, granulated, (fact'y)	ton	
solid	ton	
Gilsonite Hydrocarbon (factory)	ton	
Hydrocarbon, hard	ton	
soft	ton	
Parmr Grade 1	ton	23.00
Grade 2	ton	23.00
265°	ton	

Mold Lubricants

Mold Paste No. 1	lb.	
Rusco mold paste	lb.	.12 / .30
Sericite	ton	65.00
Soapbark (cut)	lb.	.11 / .12
Soapstone	ton	15.00 /25.00

Oils

Castor, blown, c.l., drums, returnable	lb.	.11½
Poppyseed (bbls.)	gal.	
Rapeseed, refined (bbls.)	gal.	.39 / .40

Reclaiming Oils

B. R. V.	lb.	.039 / .041
S. R. O.	lb.	.012 / .014

Reenforcers

Carbon Black		
Aerfloted Arrow Specification Black	lb.	.0535/ .0825
Arrow Compact Black	lb.	
Granulized Carbon Black	lb.	
Century (delivered)	lb.	.0445/ .0535
"Certified" Cabot	lb.	
Spheron	lb.	
Disperso (delivered)	lb.	.0445/ .0535
Dixie, c.l., f.o.b., New Orleans, La.; Galveston or Houston, Tex.	lb.	.0445
local stock, delivered	lb.	.07 / .08¼
Gastex	lb.	.03 / .07
Kosmobile	lb.	
Kosmos, c.l., f.o.b., New Orleans, La.; Galveston or Houston, Tex.	lb.	.0445
local stock, delivered	lb.	.07 / .08¼
Micronex	lb.	.0535
Beads	lb.	
Ordinary (compressed or uncompressed)	lb.	.0535
Carbonex	lb.	.030 / .0375
S	lb.	.0315/ .040
Clays		
Aerfloted Paragon	ton	7.50 /10.00
Suprex, No. 1, selected	ton	10.00
No. 2, standard	ton	7.50
Blue Ridge, dark	ton	
China	ton	
Dixie	ton	
McNamee	ton	
Par	ton	
Perfection	ton	
Standard	ton	
Witco	ton	8.50
Cumar EX	lb.	.0275/ .0375

Reodorants

Amora A	lb.	
B	lb.	
C	lb.	
D	lb.	
Para-Dors	lb.	
Rodo No. 0	lb.	
No. 10	lb.	

Rubber Substitutes or Factice

Amberex	lb.	.13¾
Black	lb.	.06½/ .09
Brown	lb.	.07 / .11
Duphax A	lb.	.095
B	lb.	.095
Fac-Cel B	lb.	.12
C	lb.	.12
White	lb.	.07½/ .12

Softeners

B. R. C. No. 555	lb.	.012 / .014
B. R. T. No. 7	lb.	.015 / .017
Burgundy pitch	lb.	.04 / .05
(net weight)	lb.	.06½/ .08
Corn oil, crude (bbls.)	lb.	.08
Cycline oil	gal.	.15 / .28
Fluxol	ton	
Genasco liquid asphalt	gal.	
Hardwood pitch, c.l.	ton	$23.50 /$25.00
Palm oil (Witco)	lb.	.05
Petrolatum, light amber	lb.	.04
Pigmentar (drums)	gal.	.25 / .27
Pigmentaroil (drums)	gal.	.25 / .27
Pine oil, dest. distilled (drums)	gal.	.44 / .48
pitch	bbl.	6.00
tar (drums)	gal.	.25 / .27
retort	gal.	.31
Plastogen	lb.	
Reogen	lb.	
Rosin oil, compounded	gal.	.34 / .39
Rubtack	lb.	.10
Sperso	lb.	
Tackol	lb.	.085 / .18
Tonox	lb.	
Witco No. 20	gal.	.15

Softeners for Hard Rubber Compounding

RSL Resin	lb.	
Resin C-55°	lb.	.0125/ .0145
70°	lb.	.0125/ .0145
85°	lb.	.0125/ .0145

Solvents

Benzol 90% (drums)	gal.	.27
Bondogen	gal.	
Carbon bisulphide (drums)	lb.	.05¼/ .08½
tetrachloride	lb.	.05¼
Dipentene, commercial (drums)	gal.	.42 / .44
Rubber (f.o.b. Group 3 refineries)	gal.	
Solvesso No. 1, tank cars	gal.	.175
No. 2	gal.	.225
No. 3	gal.	.175
No. 4	gal.	.225
Toluol	gal.	.38
Turpentine, steam distilled	gal.	.48
wood, dest. distilled (drums)	gal.	.41 / .43

Stabilizers for Cure

Laurex, ton lots	lb.	
Stearex B	lb.	.08 / .09½
Beads	lb.	.08 / .12
Stearic acid, dbl. pres'd	lb.	.09 / .14
single pressed	lb.	.08½/ .13
Zinc stearate	lb.	.20 / .25

Synthetic Rubber

DuPrene Latex Type 50	gal.	
Type D	lb.	
F	lb.	

Tackifier

B. R. H. No. 2	lb.	.015 / .017

Varnish

Shoe	gal.	1.65

Vulcanizing Ingredients

Sulphur		
Chloride, drums	lb.	.03½/ .04
Flowers, extrafine refined, U.S.P.	100 lbs.	
Rubber	100 lbs.	1.95 / 2.80
Telloy	lb.	
Vandex	lb.	

(See also Colors—Antimony)

Waxes

Carnauba, No. 3 chalky	lb.	.20
2 N.C.	lb.	
3 N.C.	lb.	.23
1 Yellow	lb.	.38 / .40
2	lb.	.37 / .38
Montan, crude	lb.	.10½
Paraffine (128/130) refined	lb.	.06½

World Rubber Shipments—Net Exports

	Long Tons—1934		
British Malaya	Aug.	Sept.	Oct.
Gross exports	52,641	61,051	47,045
Imports	17,865	17,889	10,226
Net	34,776	43,162	36,819
Ceylon	4,948	6,278	*6,918
India and Burma	552	294	....
Sarawak	1,714	1,438	1,412
British N. Borneo	1,048	839	....
Siam	1,908	1,626	1,328
Java and Madura	5,340	5,722	....
Sumatra E. Coast	8,902	10,738	....
Other N. E. Indies	10,902	14,688	....
French Indo-China	*1,610	*1,665	*1,413
Amazon Valley	710	764	....
Other America	*25	*25	*25
Guayule (Mexico)	98	....	....
Africa	*300	*300	*300
Totals	72,833	87,539	....

*Estimate. *Compiled by Leather-Rubber-Shoe Division, Department of Commerce, Washington, D. C.*

HERE'S YOUR CHANCE

. . . TO PUT THESE

WITCO PIGMENTS TO THE TEST!

We don't ask you to take the quality of these WITCO pigments for granted. We want you to put them to the test . . . let them speak for themselves in the spotlight of comparison. Because we know that they conform to the highest standards of purity and uniformity, we are making this offer . . . giving you an opportunity to compare the whole line of WITCO pigments with the pigments you are now using.

To make this test write to us, giving the quantity of each item you need for a run of your formula. We arrange to supply you with a complete batch of samples. Use these samples in making your product. Compare the finished product with the product you are now making with other pigments. We know that you will be more than pleased with the result you obtain with the WITCO line.

We stand squarely behind these pigments. Every WITCO product must meet the most rigid tests of analysis and inspection before it receives the WITCO indorsement. They meet the most exacting requirements of the rubber industry. Prove this to your own satisfaction by making this comparison. Send for samples today. If you need technical assistance in performing this test, we will gladly supply it.

All of these products conform to the WITCO tradition of quality:

DISPERSO CARBON BLACK—A specially-produced Carbon Black which gives better dispersion. It is double-checked daily, with two independent tensile tests; one at the plant where Disperso is made, another at our general research laboratories. We will meet (or better!) the most exacting specifications for Carbon Black.

WITCO CLAY—A light, fluffy Clay of good color and low oil absorption.

WITCO WHITING—Precipitated or natural. Clear, transparent Calcium Carbonate crystals. Mesh to meet your specifications. Color exceedingly white in dry form, and clean transparency when under oil.

WITCO BLANC FIXE—Direct and indirect process. Special grades for every purpose. All grades neutral.

WITCO BARYTES—Dryground — several grades of extra fine grinding. Color from snow white to gray. All grades have high Barium Sulphate content and suitable for rubber and dark paints.

WITCO MAGNESIA CARBONATE—A uniform product of the traditional WITCO quality.

WITCO MICA—Water and Dry ground. Proper results depend on the mesh. We stock all grindings to meet specifications.

WITCO STEARITE—Excellent substitute for Stearic Acid for the rubber manufacturers.

PIONEER HYDROCARBON (M.R.)—The highest quality in both solid and granular grades . . . with melting points ranging from 200° F. to 320° F. to meet your most rigid requirements.

PIONEER SULPHUR—A uniform product meeting standard specifications.

WISHNICK-TUMPEER, INC.

MANUFACTURERS AND IMPORTERS

CHICAGO, 365 E. ILLINOIS STREET NEW YORK, 251 FRONT STREET

BOSTON, 141 MILK STREET, CLEVELAND, 616 ST. CLAIR AVENUE, N. E.

WITCO OWNED AND OPERATED: CENTURY CARBON CO., THE PIONEER ASPHALT CO. and the PANHANDLE CARBON CO.

BUY DIRECT AND PROFIT DIRECTLY

COTTON AND FABRICS

NEW YORK COTTON EXCHANGE WEEK-END CLOSING PRICES

Futures	Sept. 29	Oct. 27	Nov. 3	Nov. 10	Nov. 17	Nov. 24
Nov.	12.47	12.18	12.05	12.31	12.25	....
Dec.	12.52	12.23	12.12	12.35	12.29	12.39
Jan.	12.56	12.25	12.14	12.40	12.33	12.37
Mar.	12.66	12.27	12.20	12.46	12.38	12.47
May	12.74	12.34	12.23	12.47	12.37	12.46
July	12.79	12.40	12.21	12.45	12.35	12.41
Sept.	....	12.33	12.04	12.25	12.15	12.14
Oct.	....	....	11.96	12.16	12.06	12.03

THE above table gives the nearest first and last week-end closing prices of the month previous to that under review, also the week-end closing prices of each week of the period under review. This plan permits tracing at a glance the trend of each future for approximately 2 consecutive months.

Week ended November 3. The period was marked by apprehension and lack of sound information regarding a change in NRA working hours regulation, the Government's 1935 restriction, export and price pegging loan policies, with the result that prices dropped until the last 2 sessions. Hedging in distant months, not influenced by Government loans, hammered those prices down to levels far below those of nearer months. October, 1935, for instance, sold 37 points below July, and the latter 6 points below May. Revival of activity started with AAA last month to retrieve lost export business, brought encouragement and 8 to 18 points higher prices at the close. In spite of this rise, however, the week closed 7 to 29 points below the previous week's close.

Week ended November 10. The week started with a setback because of no demand and uncertainty as to the nature of the Government's November 8 crop forecast. After the sweeping election victory for New Deal principles the Wednesday market brought a sharp and favorable upturn on the prospects of probable inflation. Short covering and mill demand with consequent hedging activity pointed the remainder of the week upward to gains of 20 to 27 points for the period. The Government crop report raised the estimate from 9,443,000 to 9,634,000 bales. Rumors from Washington indicated that while acreage restriction would prevail in 1935, it would be eased from 38,000,000 acres to approximately 43,000,000, thus permitting a crop of about 12,500,000 bales of 500 pounds each, also that action would be taken soon concerning the export situation.

Week ended November 17. Liquidation of December contracts before first notice day, November 26, started the week slightly below the previous close. Objections to extending credit to Germany, a potential buyer of 500,000 bales, also improbability of near-by inflation moves led to selling by those speculating on these prospects, with resultant recession of prices. The uneventful week ended with 7 to 12 points loss.

Week ended November 24. Liquidation of December, no news or rumors, and dull trading characterized the beginning of this period. The Secretary of Agriculture's remark that a fight would be in order in Congress to revert to removal of control of acreage caused some comment, but no activity. Reports through Washington from China indicated that American cotton consumption there would be decreased next year. Mill demand manifesting itself during the latter part of the week, also the New York Exchange Service report of the largest consumption in October since May, an increase decidedly above a regular seasonal one, brought about a closing upturn that ended the period from 9 points gain on early months to 3 points loss on far ones as compared with the previous week.

Cotton Fabrics

DUCKS, DRILLS, AND OSNABURGS. The November demand for cotton fabrics did not increase so substantially as expected. Raw cotton has advanced more than $2 a bale. Actual cotton continues at about 100 points, or $5 a bale, over futures. Some organized effort has been made to attract a general renewal of buying at first hands, by lowering the selling price in the face of higher producing costs and, broadly speaking, a lack of adequate margin for the mills.

Inquiries are slowly gaining for volume lots of fabrics for contemplated delivery over the next 4 to 5 months. Should this interest gather momentum, it would not require many days of trading to lift the fabric market out of its present low-price range. There is strong faith in a steadily improving demand for cotton fabrics and an accompanying element of price betterment.

RAINCOAT FABRICS. The Fall business is about finished, and all concerns are now sampling for their spring lines. There is not much doing in the raincoat business on account of the change in season.

SHEETING. After 2 weeks of a very active market for print cloth and sheeting where sales exceeded production, present conditions are rather quiet with prices firm. Business in the past 2 weeks has been the best since mid-August.

TIRE FABRICS. Demand is moderate and seasonal; prices steady and unchanged.

New Publications

(*Concluded from page* 60)

"Industrial Cable." General Electric Co., Schenectady, N. Y. This 128-page catalog describes and lists all standard types of insulated wire and cable used by industrials for transmission, distribution, and control, and used on or with electric equipment such as mining machinery, locomotives, arc welders, neon signs, etc. The publication does not cover the paper-insulated types of cable, used principally for transmission of large blocks of power at the higher voltages. Such types are custom-built and generally require the assistance of experienced engineers on both application and installation.

WEEKLY AVERAGE PRICES OF MIDDLING COTTON

Week Ended	Cents per Pound
Oct. 27	12.53
Nov. 3	12.37
Nov. 10	12.46
Nov. 17	12.55
Nov. 24	12.55

New York Quotations

November 26, 1934

Drills		
38-inch 2.00-yard	yd.	$0.16
40-inch 3.47-yard		.09⅜
50-inch 1.52-yard		.21¼
52-inch 1.85-yard		.17¾
Ducks		
38-inch 2.00-yard D. F.	yd.	.16
40-inch 1.45-yard S. F.		.22¼
72-inch 1.05-yard D. F.		.31⅜
72-inch 17-21-ounce		.35½
MECHANICALS		
Hose and belting	lb.	.34
TENNIS		
52-inch 1.35-yard	yd.	.23¾
***Hollands**		
GOLD SEAL		
30-inch No. 72	yd.	.19½
40-inch No. 72		.21½
RED SEAL		
30-inch	yd.	.17
40-inch		.18½
50-inch		.24½
Osnaburgs		
40-inch 2.34-yard	yd.	.13½
40-inch 3.00-yard		.10⅜
40-inch 10-ounce part waste		.15
37-inch 2.42-yard		.13¼
Raincoat Fabrics		
COTTON		
Bombazine 60 x 64	yd.	.09¾
Plaids 60 x 48		.10¼
Surface prints 60 x 64		.11¾
Print cloth, 38½-inch, 60 x 64		.06⅝
SHEETINGS, 40-INCH		
48 x 48, 2.50-yard	yd.	.11¼
64 x 68, 3.15-yard		.10¼
56 x 60, 3.60-yard		.08¾
44 x 48, 3.75-yard		.07
SHEETINGS, 36-INCH		
48 x 48, 5.00-yard	yd.	.06
44 x 40, 6.15-yard		.05
Tire Fabrics		
BUILDER		
17¼ ounce 60" 23/11 ply Karded peeler	lb.	.40
CHAFER		
14 ounce 60" 20/8 ply Karded peeler	lb.	.40
9¼ ounce 60" 10/2 ply Karded peeler	lb.	.40
CORD FABRICS		
23/5/3 Karded peeler, 1 1/16" cotton	lb.	.40
15/3/3 Karded peeler, 1 1/16" cotton	lb.	.38
23/5/3 Karded peeler, 1¼" cotton	lb.	.47
23/5/3 Combed Egyptian	lb.	.54
LENO BREAKER		
8¼ ounce and 10¼ ounce 60" Karded peeler	lb.	.35

*Prices for 1,200 yards of a width or over.

The Wellman Company

Manufacturers of

THE PATTEN SOLE CUTTING MACHINE

FOR CUTTING SOLES AND TAPS FROM SHEET STOCK AT ANY BEVEL FROM 27° TO 90°.

THESE MACHINES HAVE A CAPACITY MANY TIMES IN EXCESS OF HAND CUTTING. MANUFACTURED OF THE BEST MATERIALS AND WORKMANSHIP BUT LITTLE ATTENTION IS NECESSARY TO KEEP THEM IN SERVICEABLE CONDITION. THE SOLES CUT ARE OF SUCH STANDARD BEVEL AS MAY BE DESIRED AND POSSESS A SMOOTH AND ATTRACTIVE EDGE ADDING MUCH TO THE APPEARANCE OF THE FINISHED SHOE.

Wellman Company

Manufacturers of Rubber Sole Cutting Machinery

MEDFORD, MASS.

MT. VERNON WOODBERRY MILLS, INC.

TURNER, HALSEY CO.

SALES AGENT

40 WORTH ST., NEW YORK

BALTIMORE BOSTON — BRANCHES CHICAGO NEW ORLEANS — SAN FRANCISCO ST. LOUIS

Regular and Special Constructions

of

COTTON FABRICS

Single Filling Double Filling

and

ARMY

Ducks

HOSE and BELTING

Ducks

Drills

Selected

Osnaburgs

Curran & Barry

320 BROADWAY

NEW YORK

IMPORTS, CONSUMPTION, AND STOCKS

CRUDE rubber consumption by United States manufacturers for October totaled 31,347 long tons, against 30,352 long tons for September, an increase of 3.3% over September, but less than 1% below October, 1933, according to R.M.A. statistics. Consumption for October, 1933, was 31,543 (revised) long tons.

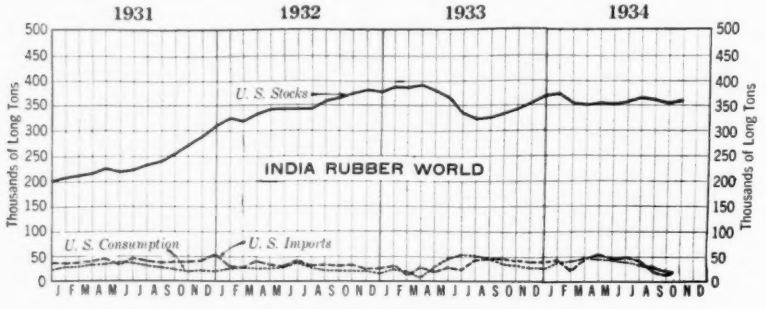
Crude rubber imports for October were 35,298 long tons, an increase of 22.4% above September and 17.9% below October, 1933, importations.

The estimated total domestic stocks of crude rubber on hand October 31 were 362,018 long tons, compared with September 30 stocks of 359,667 long tons. October 31 stocks increased less than 1% above September 30 stocks and 4.6% above stocks of October 31, 1933.

Crude rubber afloat for the United States ports on October 31 was 38,247 long tons against 38,831 long tons afloat on September 30 and 58,568 long tons afloat on October 31, 1933.

London and Liverpool Stocks

Week Ended	Tons London	Tons Liverpool
Nov. 3	64,232	58,380
Nov. 10	65,728	59,616
Nov. 17	67,109	60,281
Nov. 24	67,088	60,543


1931
1932
1933
1934
Thousands of Long Tons
U. S. Stocks
INDIA RUBBER WORLD
U. S. Consumption
U. S. Imports
J F M A M J J A S O N D J F M A M J J A S O N D J F M A M J J A S O N D J F M A M J J A S O N D

United States Stocks, Imports and Consumption

United States and World Statistics of Rubber Imports, Exports, Consumption, and Stocks

Twelve Months	U. S. Net Imports* Tons	U. S. Consumption Tons	U. S. Stocks on Hand† Tons	U. S. Stocks Afloat† Tons	United Kingdom Stocks†‡ Tons	Singapore and Penang, Etc., Stocks†‡ Tons	World Production (Net Exports)‡ Tons	World Consumption Estimated‡ Tons	World Stocks†‡‖ Tons
1931	495,163	348,986	322,825	40,455	127,103	55,458	797,441	668,660	495,724
1932	400,787	332,000	379,000	38,360	92,567	36,802	709,840	670,250	518,187
1933	411,615	405,687	364,541	55,606	86,438	48,744	845,291	818,370	489,029
1934									
January	46,204	40,413	368,660	45,768	90,272	51,427	81,487	77,200	510,359
February	31,032	40,609	357,094	53,063	92,482	52,580	88,239	82,100	502,155
March	44,605	47,097	353,242	54,722	94,314	59,224	92,070	78,000	506,494
April	45,662	44,947	351,981	56,251	96,108	63,381	84,153	88,400	508,795
May	47,954	43,012	351,329	57,921	96,197	89,758	115,612	79,300	537,278
June	49,683	40,241	358,149	46,698	99,702	82,333	70,250	75,000	542,958
July	41,530	32,647	364,883	45,869	105,904	76,417	73,279	69,100	547,204
August	33,248	33,310	362,647	40,278	105,199	77,100	75,093	79,500	544,944
September	28,835	30,352	359,667	38,831	112,951	69,824	88,894	81,200	542,442
October	35,298	31,347	362,018	38,247	.....	.....	.....	.....	.....

*Including liquid latex, but not guayule. †Stocks on hand the last of the month or year. ‡W. H. Rickinson & Son's figures. ‖Stocks at the 3 main centers, U. S. A., U. K., Singapore and Penang.

U. S. Crude and Waste Rubber Imports for 1934

	Plantations	Latex	Paras	Africans	Centrals	Guayule	Manicoba and Matto Grosso	Totals 1934	Totals 1933	Balata	Miscellaneous	Waste
Jan. ....tons	44,988	973	182	61	..	..	..	46,204	31,110	73	693	32
Feb.	30,164	750	118	..	..	..	..	31,032	18,875	70	607	..
Mar.	43,204	901	450	..	..	50	..	44,605	27,879	169	415	157
Apr.	44,394	827	324	..	17	100	..	45,662	19,459	165	633	99
May	46,440	1,230	181	..	3	100	..	47,954	27,556	143	616	117
June	48,275	1,235	115	..	8	50	..	49,683	22,729	128	553	27
July	40,217	1,064	210	35	4	..	..	41,530	44,290	107	561	55
Aug.	31,971	1,022	145	10	..	100	..	33,248	44,802	67	672	84
Sept.	27,583	912	308	30	2	..	..	28,835	47,352	75	420	39
Oct.	33,788	755	740	..	15	..	..	35,298	43,016	25	477	33
Total, 10 mos., 1934....tons	391,024	9,669	2,773	136	49	400	..	404,051	.....	1,022	5,647	643
Total, 10 mos., 1933....tons	316,815	6,501	3,685	38	29	..	..	.....	327,068	1,201	6,723	93

Compiled from The Rubber Manufacturers Association, Inc., statistics.

RUBBER SCRAP

ALL grades of rubber scrap are in active demand except tires, which are marking time in view of low prices conceded to collectors and the limitation of movement imposed by the freight rates.

BOOTS AND SHOES. These are in good demand. The available supply is somewhat scanty. Collections are very poor, primarily because of the low price.

INNER TUBES. The very good and steady demand noted last month still continues for all assorted grades.

TIRES. The call for tires by reclaimers does not run into large volume. Prices will probably increase as winter advances and collections become increasingly scanty.

SOLID TIRES. In addition to the good export demand for this grade considerable domestic inquiry is in evidence.

MECHANICALS. All grades are in steady and moderate demand at prices unchanged from last month.

HARD RUBBER. Prices continue steady in view of the small supply.

CONSUMERS' BUYING PRICES

(Carload Lots Delivered Eastern Mills)

November 26, 1934

		Prices	
Boots and Shoes			
Boots and shoes, black	lb.	$0.01	/$0.01⅛
Colored	lb.	.00¾/	.00⅞
Untrimmed arctics	lb.	.00¾/	.00⅞
Inner Tubes			
No. 1, floating	lb.	.07 /	.07¼
No. 2, compound	lb.	.03⅜/	.03½
Red	lb.	.02⅜/	.02½
Mixed tubes	lb.	.02¾/	.03
Tires (Akron District)			
Pneumatic Standard			
Mixed auto tires with beads	ton	9.00	/ 9.50
Beadless	ton	16.50	/17.00
Auto tire carcass	ton	10.00	/10.50
Black auto peelings	ton	19.00	/20.00
Solid			
Clean mixed truck	ton	35.00	/37.50
Light gravity	ton	37.50	/40.00
Mechanicals			
Mixed black scrap	lb.	.01	/ .01⅛
Hose, air brake	ton	15.00	/16.00
Garden, rubber covered	ton	13.00	/13.50
Steam and water, soft	ton	13.00	/13.50
No. 1 red	lb.	.01⅞/	.02
No. 2 red	lb.	.01⅝/	.01¾
White druggists' sundries	lb.	.02 /	.02⅛
Mechanical	lb.	.01¾/	.01½
Hard Rubber			
No. 1 hard rubber	lb.	.10⅞/	.11½

A.C.S. Meetings

(*Continued from page 57*)

Tumpeer, Inc., 365 E. Illinois St., Chicago, Ill.

Boston Group

THE Boston Group, Rubber Division, A. C. S., has tentatively set January 7, 1935, for its next meeting, when Dr. Ernst A. Hauser, of Vienna, Austria, will speak on a new subject, "Casted Rubber." Complete details of the program are not yet determined, but will be announced in season for the information of those desiring to attend.

CLASSIFIED ADVERTISEMENTS

ALL CLASSIFIED ADVERTISING MUST BE PAID IN ADVANCE

GENERAL RATES	SITUATIONS WANTED RATES	SITUATIONS OPEN RATES
Light face type $1.00 per line (ten words)	Light face type 40c per line (ten words)	Light face type 75c per line (ten words)
Bold face type $1.25 per line (eight words)	Bold face type 55c per line (eight words)	Bold face type $1.00 per line (eight words)

Allow nine words for keyed address. *Replies forwarded without charge.*

SITUATIONS WANTED

CHEMIST COMPOUNDER, THOROUGHLY EXPERIENCED IN up-to-date compounding and manufacturing of mechanical goods and in combining rubber to metal and processes for treating metals in order to insure maximum adhesion of rubber. Experienced in the manufacture of friction tapes and cements. Would consider starting in with a new company or old established firm. Address Box No. 439, care of INDIA RUBBER WORLD.

WANTED: POSITION AS FACTORY MANAGER OR SUPERINtendent by experienced man at present employed who can swing immediate additional business to a small mechanical rubber plant with low overhead. New England Christian concern preferred, having calender, tubing machine, and presses. Address Box No. 440, care of INDIA RUBBER WORLD.

EXPERIENCED RUBBER MAN: 10 YEARS' EXPERIENCE AS superintendent, compounder, and chemist, principally mechanicals and dipped goods. Familiar with production problems and costs. College man. Good handler of men. Employed. Address Box No. 441, care of INDIA RUBBER WORLD.

RUBBER CHEMIST, WITH 9 YEARS' LABORATORY AND FACtory experience and 8 years as sales executive, desires position. Qualified to organize and manage a rubber chemical sales department. Address Box No. 442, care of INDIA RUBBER WORLD.

SITUATIONS OPEN

CALENDER AND MILL MAN. MUST FURNISH GOOD REFERences. Reply giving full information to P. O. Box 157, Rahway, N. J.

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SOLE PRODUCERS
ASBESTINE
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Genasco (M.R.) Hydrocarbon
(SOLID OR GRANULATED)
A hard, stable compound—produced under the exacting supervision of an experienced and up-to-date laboratory.
Aging tests have proved Genasco to be *always* of uniform quality. Shipped to all parts of the world in metal drums. Stocks carried at Maurer, N. J. and Madison, Ill.
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THE BARBER ASPHALT COMPANY

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We Solicit Your Inquiries
THE BARR RUBBER PRODUCTS COMPANY
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Operating, Globe, Angle, or Check Valves—Hydraulic Presses, Accumulators, Pumps, etc. —For almost any size or pressure.
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Branch Office:
576 No. 20th Street
EAST ST. LOUIS, ILL.

(*Advertisements continued on page 81*)

Rubber Restriction Inequities

Their Competitive Effect on Rubber Manufacturers

SIR ERIC GEDDES' address to stockholders at the annual meeting of Dunlop in London, May 16, 1934, included the following statements:

"Despite labor shortage, causing a rise in labor costs and curtailed output, Dunlop's f.o.b. cost for the past year breaks even with that for the previous year at 2.17 pence per pound.

"In principle, a quota scheme, to be fair and equitable, must rest on quotas based on the same principles for all the parties concerned. Those in touch with statistics of rubber production must realize that 3 of the contracting countries have received terms out of all proportion to which they were entitled (Indo-China, Sarawak, and Siam) while Liberia and Brazil are not included at all. Such departures may have been necessary to secure general assent, but they destroy the equity of the scheme. Our formidable competitors are given an advantage over us as manufacturer-producers, through operating in areas which are either not restricted or only partially so."

Sir Eric seems to have missed, or intentionally ignored, the crowning inequity of the International Rubber Control Scheme, which shoulders upon Dutch native producers the heaviest restriction burden, and in addition taxes each producer (under present regulations) nearly 50% of the price his product would sell for if free of export tax, but at the time he made the remarks quoted above, the rubber world did not know how the Netherland India Government would distribute its quota, or how the export tax on native rubber would be applied. Sir Eric can therefore be excused for not taking up the cudgels for the Dutch natives at that time, especially since his company was more vitally concerned with other inequities. As time passes, that aspect of the situation is bound to command increasing attention.

The recently reported decision of the Government to utilize moneys derived from the Dutch Native Rubber Restriction Export Tax for the purpose of reducing other taxes imposed on natives does not alter the basic serious inequity of underassessment of the native production quota as compared with their capacity to produce, and as compared with any other group of producers involved in the international agreement. The primary purpose of this article, however, is to clarify and discuss Sir Eric's statement in terms that the American trade will understand.

While the broad basis of his complaint, inequity, would comprehend most of the faults in any control, Sir Eric's remarks appear to reflect a fear that his company is placed at a disadvantage in comparison with other major competitors, under the terms of the control. Let us explore this possibility and see where it leads us.

The competitors referred to by implication in Sir Eric's statement are Michelin with plantations in Indo-China, Firestone with plantations in Liberia, and Ford in Brazil.

The Intergovernmental Rubber Control Agreement permits Indo-China to export up to 30,000 tons annually without any restriction on production, and above that quantity restriction is contingent on certain conditions. Since Indo-China exported less than 18,500 tons in 1933, when there was a very large increase over any previous year, it is apparent that during the 4½-year term of the control thus far agreed upon, producers in Indo-China will be practically free to produce at capacity. Michelin, with plantations in Indo-China, is free to produce as much rubber as possible, and this is expected to give him an advantage in rubber costs that will increase his competitive strength in the tire trade. Michelin has tire factories in France, Italy, England, Germany, and Spain.

Liberia is not a party to the rubber control scheme, and the Firestone company is therefore free to develop production there on its young estates as rapidly as possible. The Firestone company has factories in the United States, Canada, England, Argentina, and Spain. Brazil, where the Ford company is developing its concession, is likewise outside the scheme, but plantations there cannot be of much importance in production during the next 5 years, and Ford is not a very important rubber manufacturer.

The advantage that Michelin and Firestone are alleged to possess over Dunlop is limited to the difference between their costs for that percentage of their rubber produced on their own plantations and the average open market price for rubber. If it were assumed that they could produce 20% of their rubber requirements at 5¢ a pound (very liberal assumptions), and that the market price for rubber would average 15¢ a pound for the period of the control, their advantage over competitors not producing any of their own rubber would work out at 2¢ per pound on all rubber consumed.

But Dunlop also has plantations and even under restriction will probably produce a higher percentage of its requirements than either of the 2 competitors mentioned. Goodyear and U. S. Rubber, with large plantations in the restriction areas, are in the same situation as Dunlop. These 5 large companies and Italian Pirelli are the only important manufacturer-producers.

All other rubber manufacturing companies will, therefore, be placed at a disadvantage in crude rubber costs in comparison with the companies named above, the advantage of each manufacturer-producer depending upon the extent to which his production cost is exceeded by the market price for rubber and upon the extent to which the company's production supplies its requirements. This advantage might reasonably be expected to range from a fraction of a cent up to possibly 4¢ a pound for different companies.

One effect of the restriction scheme is, therefore, to give added competitive strength to a few large manufacturing firms which are in a position to produce a substantial part of their rubber requirements on their own plantations.

Since the Dunlop company is generally believed to be one of the lowest-cost producers, the complaint voiced by Sir Eric Geddes does not appear to be justified on the part of his company, during the first term of the rubber control. When the 4½-year period terminates, and the question of extension of the international agreement comes up, if the French persist in their position of giving merely nominal support to the scheme, the complaint will rest on sounder ground. It is perhaps this eventuality that gave rise to the statement. On the other hand the statement may reflect a desire that the Dunlop plantations be given a preferred quota assessment by restriction authorities, and perhaps other manufacturing companies with plantations in the restricted areas may seek such preferential treatment. If any such preferences are accorded to manufacturer-producers, it will be to the disadvantage of other manufacturers throughout the world.

The apparent inequity of the rubber control, so far as revealed to date, is that European producers and large producer-manufacturers obtain benefits against native producers and all other manufacturers.

The importance of this advantage to manufacturer-producers resulting from the application of restriction may easily be taken too seriously; it should not be overemphasized. The advantage in cents per pound of rubber is far less now than it was in 1922-1928, but at that time there were fewer manufacturer-producers, and their plantation production did not represent so high a percentage of their requirements as now. It was realization of the stronger position of the manufacturers operating plantations under the Stevenson Scheme that caused other manufacturers to engage in, or extend their holdings in, the plantation industry.

The restriction advantage of a manufacturer-producer at present might easily be offset by a manufacturer with a large crude rubber supply on hand or a long forward position at favorable prices, or merely by greater efficiency in production and/or distribution of finished products.

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Crude Rubber
Liquid Latex
Carbon Black
Clay

Stocks of above carried at all times

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Classified Advertisements

Continued

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CHEMIST WANTED: MUST BE ABLE TO TAKE COMPLETE charge of plant and have experience in mechanical pressed goods, hard rubber and inflated goods. Good opportunity for the right man. Address Box No. 438, care of INDIA RUBBER WORLD.

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FOR SALE: ONE 2-ROLL CALENDER 14 BY 14" BELTED TO motor; three Devine Vulcanizers, 5' by 11' long; one 18 by 54" Birmingham 4-roll Calender; one unused 18 by 30" heavy duty FARREL MILL, chain drive; complete line of W. & P. Mixers, Vacuum Shelf Driers, Calenders, Mills, Colloid Mills, Pebble Mills, Dough Mixers, Hydraulic Presses, Pumps, etc. Rebuilt, guaranteed. What machinery have you for sale? CONSOLIDATED PRODUCTS CO., INC., 13-16 Park Row, New York, N. Y.

FOR SALE: VACUUM SHELF DRIERS, W & P MIXERS, CALenders, Mills, Hydraulic Presses, etc. We also buy your surplus equipment for cash. STEIN-BRILL CORP., 183 Varick St., New York, N. Y.

OFFERS FOR SALE: 1—Birmingham Calender with Birmingham gear and magnetic clutch; Adamson 3-roll 24"x66" Calender, with connecting gears and drive gears; Yale & Towne Industrial High Lift Truck, 4,000 lb. capacity; 10x12 Ingersoll and Rand Air Compressor, with 35 H.P. slip ring 220 volt motor; one Southwark Hydraulic Press, 36x36 with 4 openings, 14" ram.

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CROSSROADS OF
THE RUBBER INDUSTRY

ARRANGE NOW TO INCLUDE
INDIA RUBBER WORLD
IN YOUR
1935
ADVERTISING BUDGET
IT WILL PAY DIVIDENDS

GUARANTEED REBUILT MACHINERY

IMMEDIATE DELIVERIES FROM STOCK

MILLS, CALENDERS, TUBERS, HYDRAULIC PRESSES, PUMPS,
VULCANIZERS, TIRE MAKING EQUIPMENT, MOULDS, ETC.

UNITED RUBBER MACHINERY EXCHANGE
319-323 FRELINGHUYSEN AVE., Cable Address "Urme" NEWARK, N. J.

United States Statistics

Imports for Consumption of Crude and Manufactured Rubber

	July, 1934		Seven Months Ended July, 1934	
UNMANUFACTURED—*Free*	Pounds	Value	Pounds	Value
Crude rubber	92,831,677	$9,670,617	682,044,099	$58,083,073
Liquid latex	2,757,167	385,733	19,207,952	2,187,413
Jelutong or pontianak	1,080,286	87,412	7,640,441	669,421
Balata	358,596	63,963	1,850,343	361,638
Gutta percha	258,404	32,112	2,215,649	229,889
Guayule	.....	.....	671,500	56,742
Scrap and reclaimed, etc.	1,154,587	10,751	6,262,036	53,834
Totals	98,440,627	$10,250,588	719,892,020	$61,642,010
Chicle, crude ...*Free*	756,256	$125,132	4,199,907	$927,782
MANUFACTURED—*Dutiable*				
Rubber soled footwear with fabric uppers ...*pairs*	102,809	$15,798	937,774	$254,269
Rubber toys	.....	23,581	.....	174,404
Druggists' sundries, n. e. s.	.....	7,384	.....	47,109
Combs, hard rubber..*number*	87,960	4,972	853,898	40,319
Golf balls ...*number*	59,592	13,042	381,482	93,696
Tennis and other rubber balls ...*number*	139,792	12,589	1,575,432	118,184
Tires ...*number*	495	947	5,084	14,750
Other rubber manufactures.	.....	32,384	.....	276,688
Totals	.....	$110,697	.....	$1,019,419

Exports of Foreign Merchandise

RUBBER AND MANUFACTURES				
Crude rubber	5,300,339	$660,199	37,261,988	$3,706,024
Balata	5,678	1,858	70,965	19,335
Guayule	.....	.....	16,800	1,419
Gutta percha, rubber substitutes, and scrap	.....	.....	1,942	706
Rubber manufactures	.....	489	.....	11,169
Totals	.....	$662,546	.....	$3,738,653

Exports of Domestic Merchandise

RUBBER AND MANUFACTURES				
Reclaimed	1,499,554	$68,119	6,796,689	$317,210
Scrap	2,981,045	86,782	23,530,167	513,315
Rubberized automobile cloth, *sq. yd.*	93,898	45,191	487,676	252,546
Other rubberized piece goods and hospital sheeting..sq. yd.	61,668	31,041	428,820	189,897
Footwear				
Boots ...*pairs*	2,764	6,280	28,977	70,823
Shoes ...*pairs*	12,832	5,469	108,556	52,423
Canvas shoes with rubber soles ...*pairs*	17,790	10,447	105,491	65,464
Soles ...*doz. pairs*	2,338	3,895	23,676	36,638
Heels ...*doz. pairs*	42,142	21,256	213,516	112,601
Water bottles and fountain syringes ...*number*	22,164	7,859	113,883	41,560
Gloves ...*doz. pairs*	4,808	10,689	32,934	69,212
Other druggists' sundries...	.....	32,317	.....	206,735
Balloons ...*gross*	11,501	10,294	114,933	104,851
Toys and balls	.....	2,588	.....	20,207
Bathing caps ...*doz.*	9,061	15,539	73,715	131,363
Bands	22,793	7,524	181,143	58,586
Erasers	39,424	22,437	197,488	107,930
Hard rubber goods				
Electrical goods	178,328	14,967	743,387	76,460
Other goods	.....	11,700	.....	86,564
Tires				
Truck and bus casings, *number*	21,592	362,009	185,612	2,855,725
Other automobile casings, *number*	64,890	427,720	509,843	3,427,653
Tubes, auto ...*number*	60,196	66,504	467,876	511,862
Other casings and tubes, *number*	3,516	11,630	27,743	75,538
Solid tires for automobiles and motor trucks.*number*	2,072	29,231	5,952	133,518
Other solid tires	78,192	9,794	849,828	107,636
Tire sundries and repair materials	.....	28,375	.....	225,799
Rubber and friction tape....	49,756	13,121	335,320	87,310
Belting	242,757	102,467	1,390,829	612,545
Hose	531,517	135,393	2,659,432	723,968
Packing	71,959	30,888	591,193	243,583
Thread	51,820	30,810	728,780	435,953
Other rubber manufactures..	.....	84,050	.....	713,387
Totals	.....	$1,746,386	.....	$12,668,862

London Stocks, September, 1934

			Stocks, September 30		
LONDON	Landed Tons	Delivered Tons	1934 Tons	1933 Tons	1932 Tons
Plantation	10,949	3,797	56,022	39,184	44,901
Other grades	2	4	81	53	41
LIVERPOOL					
Plantation	*3,779	*3,177	*56,848	*55,735	*58,149
Total tons, London and Liverpool	14,730	6,978	112,951	94,972	103,091

* Official returns from the recognized public warehouses.

Rubber Goods Production Statistics

		1934	1933
TIRES AND TUBES*		August	August
Pneumatic casings			
Production	*thousands*	3,427	3,995
Shipments, total	*thousands*	4,179	3,766
Domestic	*thousands*	4,091	3,674
Stocks, end of month	*thousands*	8,436	5,656
Solid and cushion tires			
Production	*thousands*	18	16
Shipments, total	*thousands*	16	13
Domestic	*thousands*	15	13
Stocks, end of month	*thousands*	33	24
Inner tubes			
Production	*thousands*	3,570	3,933
Shipments, total	*thousands*	4,072	3,750
Domestic	*thousands*	4,003	3,685
Stocks, end of month	*thousands*	7,328	5,303
Raw material consumed			
Fabrics	*thous. of lbs.*	13,724	16,821
MISCELLANEOUS PRODUCTS			
Rubber bands, shipments	*thous. of lbs.*	237	260
Rubber clothing, calendered			
Orders, net	*no. of coats and sundries*	....	21,525
Production	*no. of coats and sundries*	....	41,610
Rubber-proofed fabrics, production, total.	*thous. of yds.*	4,291	5,136
Auto fabrics	*thous. of yds.*	570	466
Raincoat fabrics	*thous. of yds.*	1,827	2,791
Rubber flooring, shipments	*thous. of sq. ft.*	413	319
Rubber and canvas footwear			
Production, total	*thous. of prs.*	5,161	5,319
Tennis	*thous. of prs.*	1,011	1,898
Waterproof	*thous. of prs.*	4,150	3,421
Shipments, total	*thous. of prs.*	6,529	5,126
Tennis	*thous. of prs.*	1,543	1,640
Waterproof	*thous. of prs.*	4,986	3,487
Shipments, domestic, total	*thous. of prs.*	6,448	5,043
Tennis	*thous. of prs.*	1,467	1,575
Waterproof	*thous. of prs.*	4,982	3,468
Stocks, total, end of month	*thous. of prs.*	18,567	13,749
Tennis	*thous. of prs.*	5,983	4,134
Waterproof	*thous. of prs.*	12,584	9,616
Rubber heels			
Production	*thous. of prs.*	18,605	22,632
Shipments, total	*thous. of prs.*	15,493	18,410
Export	*thous. of prs.*	339	282
Repair trade	*thous. of prs.*	4,936	7,352
Shoe manufactures	*thous. of prs.*	10,218	10,775
Stocks, end of month	*thous. of prs.*	42,140	24,123
Rubber soles			
Production	*thous. of prs.*	3,601	5,177
Shipments, total	*thous. of prs.*	3,602	4,392
Export	*thous. of prs.*	2	8
Repair trade	*thous. of prs.*	382	579
Shoe manufactures	*thous. of prs.*	3,218	3,806
Stocks, end of month	*thous. of prs.*	4,894	3,011
Mechanical rubber goods, shipments			
Total	*thous. of dollars*	3,923	3,892
Belting	*thous. of dollars*	984	975
Hose	*thous. of dollars*	1,399	1,298
Other	*thous. of dollars*	1,540	1,619

*Data for 1934 are estimated to represent approximately 97% of the industry.

Source: *Survey of Current Business*, Bureau of Foreign & Domestic Commerce, Washington, D. C.

Imports by Customs Districts

	—September, 1934— *Crude Rubber		—September, 1933— *Crude Rubber	
	Pounds	Value	Pounds	Value
Massachusetts	6,557,428	$859,754	11,094,630	$677,557
New York	54,743,139	6,562,744	77,089,376	4,852,949
Philadelphia	892,340	116,043	3,234,171	184,126
Maryland	307,455	37,869	4,988,338	244,852
Mobile	1,206,280	133,374	.....	.....
New Orleans	1,409,598	158,048	1,180,617	63,071
Los Angeles	6,310,458	708,917	5,047,001	307,186
San Francisco	275,520	30,077	584,691	29,845
Colorado	.....	.....	392,000	18,886
Totals	71,702,218	$8,606,826	103,610,824	$6,378,472

*Crude rubber including latex dry rubber content.

Rubber Trade Inquiries

The inquiries that follow have already been answered; nevertheless they are of interest not only in showing the needs of the trade, but because of the possibility that additional information may be furnished by those who read them. The Editor is therefore glad to have those interested communicate with him.

No.	INQUIRY
1711	Manufacturer of 8-ounce hard rubber bottles.
1712	Manufacturer of Vestagloss.
1713	Manufacturer of machines for rubberizing fabrics.
1714	Manufacturers of tire retreading machinery.
1715	Manufacturers of dipped goods.
1716	Manufacturer of rubber parts for electric refrigerator showcases.
1717	Manufacturer of varnish to coat rubber goods.
1718	Manufacturer of Dioxyoktadekan.